ENVIRONMENTAL PRODUCT DECLARATION

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

HALTON OY

CHILLED BEAMS

HALTON REX RXP, HALTON REX RE6,
HALTON REX REE

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GENERAL INFORMATION

Manufacturer information

Manufacturer	Halton Oy
Address	Haltonintie 1-3, 47400 Kausala
Website	https://www.halton.com/

Product identification

Product name	Chilled beams, VAV-type
Declared unit	1 unit
Specific product name	Halton Rex RXP, Halton Rex RE6, Halton Rex REE
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, FINLAND
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	Natalia Pennanen, Anni Viitala, Granlund Oy, Malminkaari 21 00701 Helsinki, FINLAND
EPD verification	Independent verification of this EPD and data, according to ISO 14025: ☑ Internal certification ☐ External verification
Verification date	-
EPD verifier	-
RTS EPD number	-
ECO Platform nr.	-
Publishing date	26th May 2023
Version	1.0

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PRODUCT INFORMATION

Product description

This environmental declaration covers the environmental impacts of chilled beams manufactured by Halton Oy in Kausala Finland. The EPD contains three different products with different sizes:

Halton Rex RXP	Halton Rex RE6	Halton Rex REE
• 600 mm • 1200 mm	• 1200 mm • 1300 mm • 1400 mm • 1500 mm • 1600 mm • 1700 mm • 1720 mm • 1800 mm • 1900 mm • 2000 mm • 2100 mm • 2200 mm • 2300 mm • 2400 mm • 2500 mm • 2600 mm • 2700 mm • 2800 mm • 2900 mm • 3000 mm • 3100 mm • 3200 mm • 3300 mm • 3400 mm • 3500 mm • 3600 mm	• 1200 mm • 1300 mm • 1400 mm • 1500 mm • 1600 mm • 1700 mm • 1800 mm • 1900 mm • 2000 mm • 2100 mm • 2200 mm • 2300 mm • 2400 mm • 2500 mm • 2600 mm • 2700 mm • 2800 mm • 2900 mm • 3000 mm • 3100 mm • 3200 mm • 3300 mm • 3400 mm • 3500 mm • 3600 mm • 3700 mm • 3800 mm • 3900 mm • 4000 mm • 4100 mm • 4200 mm • 4300 mm • 4400 mm • 4500 mm • 4600 mm • 4700 mm • 4800 mm

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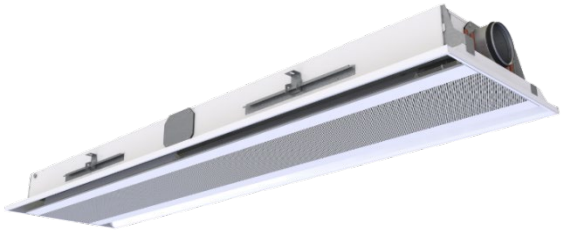
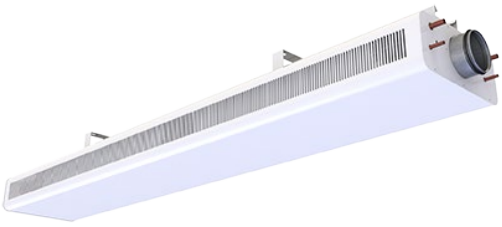
Product application

Halton Rex RXP chilled beams are used for cooling and ventilation in offices, hospital rooms, schools, and public spaces.

Halton Rex RE6 chilled beams are ideal for rooms with high cooling load, low humidity load and variable ventilation demand. Typical applications are office rooms, landscape offices and conference rooms.



Halton Rex REE chilled beams are used for controlling the ventilation airflow, room temperature, and indoor air quality in office spaces and meeting rooms.



Chilled beams provide excellent thermal comfort and draught-free conditions. They operate silently, fulfilling even the highest acoustic demands of working, relaxing and healing environments.

Halton's broad range of chilled beams includes both active and passive beams. Halton chilled beams are designed to provide excellent comfort and flexibility with a lower carbon footprint. Halton chilled beams are certified by Eurovent Certita.

Active chilled beams

Active chilled beams supply fresh air and condition the room air. They suit a variety of applications from offices and meeting rooms to hotel rooms and hospital ward rooms. The Halton product range includes adaptable active chilled beams and active chilled beams. Chilled beams are available for exposed, suspended ceiling, and bulkhead installation.

Passive chilled beams

Passive beams are often used together with a separate supply air solution to provide additional cooling. Positioning of the passive beams is flexible, and the units can be placed within a suspended ceiling, above a grid ceiling or fully exposed. Typical applications are office rooms, meeting areas and retail stores.

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Product raw material composition and technical information

	Halton Rex RXP	Product sizes (mm)	
		600	**1200**
Material	***Steel***	84 %	81 %
	Copper	7 %	8 %
	Aluminium	7 %	10 %
	Powder coating	1 %	1 %
	Others	< 1%	< 1%
	Total (kg)	**11,2**	**21,5**

	Halton Rex RE6	Product sizes (mm)
		1200 - 3600
Material	***Steel***	82 - 77 %
	Copper	8 - 9 %
	Aluminium	9 - 12 %
	Coating	< 1%
	Others	< 1%
	Total (kg)	**19,9 - 56,2 kg**

	Halton Rex REE	Product sizes (mm)
		1200 - 3600
Material	***Steel***	81,6 - 77 %
	Copper	7,3 - 9 %
	Aluminium	7,9 - 12 %
	Coating	< 1%
	Others	< 1%
	Total (kg)	**23,2 - 74,8 kg**

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Packaging material composition and technical information

MAIN PACKAGING MATERIALS OF CHILLED BEAMS, HALTON REX RXP

	Halton Rex RXP	Product sizes (mm)	
		600	**1200**
Material	***Cardboard***	30 %	19 %
	Kraft paper	30 %	26 %
	Wood pallet	41 %	55 %
	Total (kg)	**5,1**	**11,5**

MAIN PACKAGING MATERIALS OF CHILLED BEAMS, HALTON REX RE6

	Halton Rex RE6	Product sizes (mm)
		1200 - 3600
Material	***Plastic film***	2 - 3%
	Cardboard	3 - 2 %
	Wood pallet	95 %
	Total (kg)	**8,3 - 15,9**

MAIN PACKAGING MATERIALS OF CHILLED BEAMS, HALTON REX REE

	Halton Rex REE	Product sizes (mm)
		1200 - 3600
Material	***Plastic film***	2 - 3%
	Cardboard	2 %
	Wood pallet	95 - 96 %
	Total (kg)	**9,5 - 20,8**

Substances, REACH - very high concern

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

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LIFE-CYCLE ASSESSMENT

Life-cycle assessment information

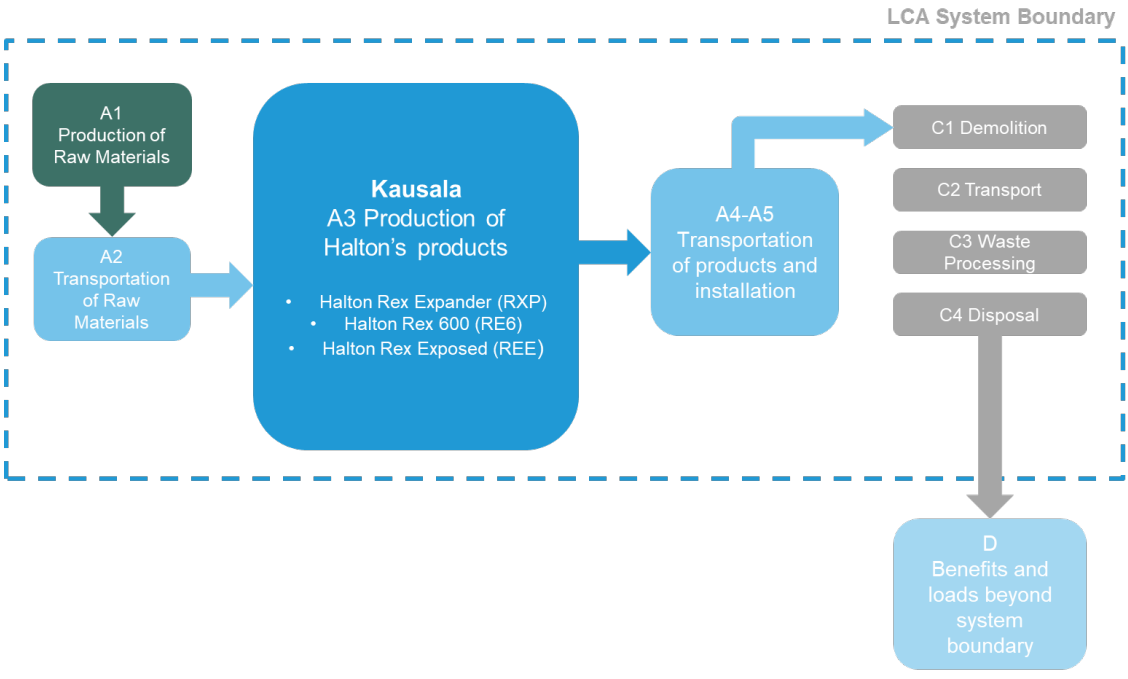
Period for data	1 year, 2021

Declared unit

Declared unit	1 item
Mass per declared unit	RXP 600/1200 11,2 / 21,5 kg RE6 1200 19,86 kg REE 1200 23,21 kg EPD results of other product sizes can be scaled by using calculation formulas that are presented in following chapter.

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 (EoW) point of the recycled steel raw material was assumed to be after scrap steel collection, sorting and preparation. Processing of scrap steel in steel production was considered to be part of the next life cycle and included in the system boundaries of the studied product. EoW 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. EoW point of

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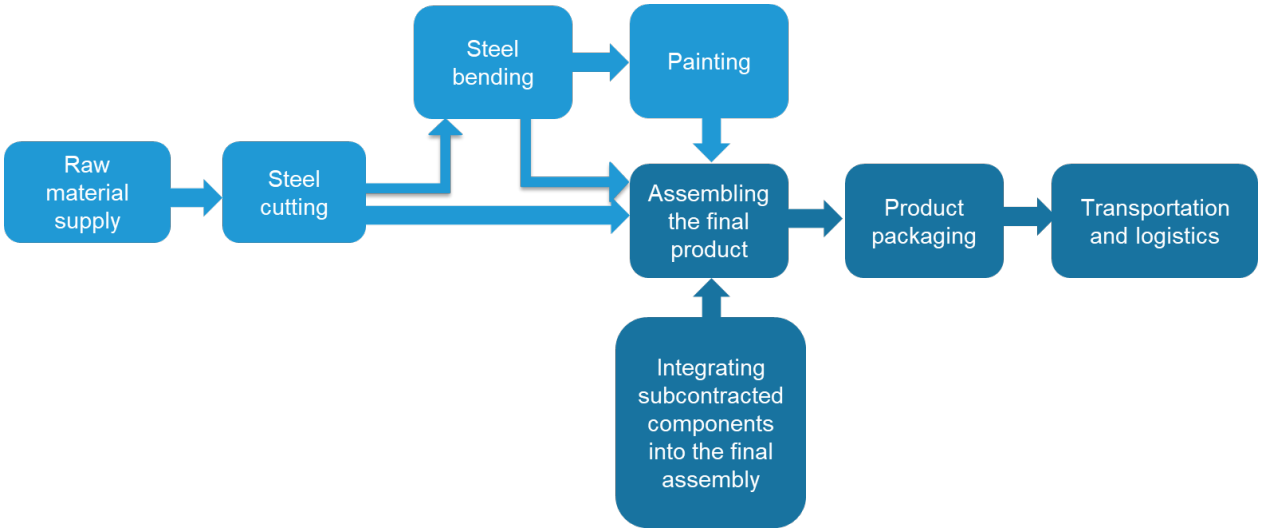
the waste flows in A3-module is the step when materials are collected and handled in the sorting plant. EoW point of the packaging materials collected for recycling in A5 module is the point when materials are collected and handled in the sorting plant.

Production stage (A3) on the Halton´s production sites cover the following manufacturing processes; raw material supply (steel, plastics, and sealants), steel cutting, steel bending, painting, assembly, and packaging. After that, products will be transported to the client. The production processes of products are presented in the 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/demolition	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

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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
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 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. Allocation could not be avoided for following inputs as the information was only measured on factory process level.

- Electricity consumption and heat production: 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 in kilograms).

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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 product manufacturing and waste processing in A1-A3 modules are allocated for this co-product based on mass (kg).

KEY ASSUMPTIONS

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

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 processing and disposal: It was assumed that products are collected, and the materials are separated.

- Steel, copper and aluminium to material recycling
- Plastics components to energy recovery
- Sealants to final disposal.

Module D covers the net benefits and loads arising from the reuse of products or the recycling or 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 0,01 kWh/kg and efficiency of heat and power co-generation was 90 %.
- Recycling: Benefits from the recycling of steel, copper and aluminium materials were included to the assessment. Only share of virgin raw materials in the product composition were included to the module D.
    - Steel: Benefits from avoided primary steel production due to the recycling of steel at end of life was included.
    - Copper: Benefits from avoided primary copper production due to the recycling of copper at end of life was included.
    - Aluminium: Benefits from avoided primary aluminium production due to the recycling of aluminium at end of life was included.

It was assumed that 5 % of recyclable or recoverable materials end up as material loss.

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.

PROCEDURES FOR COLLECTING 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

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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 from Ecoinvent 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.

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ENVIRONMENTAL IMPACT DATA

Calculation of EPD results for different product sizes

Halton Rex RXP, 600 and 1200

Scaling factors are not presented for Halton Rex RXP since the LCIA results of both sizes are shown in this EPD.

Halton Rex RE6, 1200 – 3600

EPD covers LCIA result tables for Halton Rex RE6, 1200, Halton Rex RE6, 1300 and Halton Rex RE6, 1400. This product comes with different product sizes and the results presented in this EPD are representative for Halton Rex RE6, 1400. It was concluded this size can be used as the reference (the results in the EPD) and that the results for all other products can be scaled with a calculation formula and the length of the product.

The results of other product sizes can be scaled accordingly with the help of calculation formula:

$$Results\ per\ RE6\ = LCIA\ Results\ for\ RE6\ 1400 * \frac{Length, mm}{1400\ mm}$$

To conclude this, the 10 % rule based on EN 15804 was checked for all LCIA-indicators to check whether it was possible to declare all product variants in the same EPD or not. The calculations for the LCIA-indicators showed that the 10 % rule was fulfilled for all environmental impact categories except materials for recycling and Use of renewable primary energy resources as raw materials MJ and Total use of renewable primary energy. For these indicators, the variation is stated in the Table below. However, by using the conversion factors all these impact categories are overestimated and therefore this is considered a conservative approach.

LCIA Indicator	Difference to results obtained by conversion factors
Materials for recycling	16 % Higher
Total use of renewable primary energy MJ	16 % Higher
Use of renewable primary energy resources as raw materials MJ	31 % Higher

Product specific conversion tables for exceptional LCIA indicators are presented in Annex 3.

Halton Rex REE, 1200 – 4800

Product is covered with different product sizes and the results presented in this EPD is representative for Halton Rex REE, 1200. It was concluded this size can be used as the reference (the results in the EPD) and that the results for all other products can be scaled with a conversion factor and the length of the product.

The results of other product sizes can be scaled accordingly with the help of the following formula:

$$Results\ per\ REE\ = LCIA\ Results\ for\ REE\ 1200 * \frac{Length, mm}{1200\ mm} * 0{,}93$$

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To conclude this, the 10 % rule based on EN 15804 was checked for all LCIA-indicators to check whether it was possible to declare all product variants in the same EPD or not. The calculations for the LCIA-indicators showed that the 10 % rule was fulfilled for all environmental impact categories except GWP Biogenic, Materials for energy recovery, Materials for recycling, Total use of renewable primary energy, Use of renewable primary energy resources as raw materials. For these indicators, the variation is stated in the Table below. However, by using the conversion factors all these impact categories are overestimated and therefore this is considered as a conservative approach.

LCIA Indicator	Difference
GWP Biogenic	18…24 % Higher
Materials for energy recovery kg	19…61 % Higher
Materials for recycling	13…37 % Higher
Total use of renewable primary energy	16…28 % Higher
Use of renewable primary energy resources as raw materials MJ	23…70 % Higher

Product specific conversion tables for exceptional LCIA indicators are presented in Annex 3.

EPD results for reference products

Halton Rex RXP, 600

CORE ENVIRONMENTAL IMPACT INDICATORS – EN 15804+A2, PEF

Impact category	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
GWP – total	kg CO_2e	3,73E+01	1,91E-1	4,82E+00	0,00E+00	7,66E-2	1,30E+00	8,51E-4	-1,98E1
GWP – fossil	kg CO_2e	4,06E+01	1,92E-1	2,36E-1	0,00E+00	7,65E-2	1,32E+00	8,43E-4	-1,97E1
GWP – biogenic	kg CO_2e	-3,37E0	1,4E-4	4,59E+00	0,00E+00	5,55E-5	-1,34E-2	6,81E-6	1,6E-2
GWP – LULUC	kg CO_2e	1,17E-1	5,79E-5	1,05E-4	0,00E+00	2,3E-5	5,33E-4	4,05E-7	-1,32E-1
Ozone depletion pot.	kg CFC_{-11}e	3,95E-6	4,52E-8	3,51E-8	0,00E+00	1,8E-8	1,2E-7	2,62E-10	-1,14E-6
Acidification potential	mol H^+e	8,79E-1	8,08E-4	1,19E-3	0,00E+00	3,21E-4	5,73E-3	7,19E-6	-1,39E-1
EP-freshwater[3)]	kg Pe	5,86E-3	1,56E-6	5,02E-6	0,00E+00	6,22E-7	2,38E-5	1,48E-8	-9,51E-4
EP-marine	kg Ne	7,01E-2	2,43E-4	3,95E-4	0,00E+00	9,68E-5	1,25E-3	2,44E-6	-1,97E-2
EP-terrestrial	mol Ne	1,81E+00	2,69E-3	4,2E-3	0,00E+00	1,07E-3	1,43E-2	2,68E-5	-2,38E-1
POCP (“smog”)	kg NMVOCe	2,51E-1	8,64E-4	1,41E-3	0,00E+00	3,44E-4	4,15E-3	7,76E-6	-9,86E-2
ADP-minerals & metals	kg Sbe	4,05E-2	3,28E-6	6,36E-6	0,00E+00	1,31E-6	1,7E-5	9,06E-9	-1E-3
ADP-fossil resources	MJ	7,57E+02	2,99E+00	2,84E+00	0,00E+00	1,19E+00	9,79E+00	1,98E-2	-1,97E2
Water use[2)]	m^3e depr.	2,65E+01	1,11E-2	2,15E-2	0,00E+00	4,43E-3	9,84E-2	8,87E-4	-8,75E0

[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 PO_4e.

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USE OF NATURAL RESOURCES

Impact category	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
Renew. PER as energy	MJ	7,67E+01	3,76E-2	1,4E-1	0,00E+00	1,5E-2	1,01E+00	3,27E-4	-4,72E1
Renew. PER as material	MJ	4,60E+01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Total use of renew. PER	MJ	1,23E+02	3,76E-2	1,4E-1	0,00E+00	1,5E-2	1,01E+00	3,27E-4	-4,72E1
Non-re. PER as energy	MJ	7,54E+02	2,99E+00	2,84E+00	0,00E+00	1,19E+00	9,79E+00	1,98E-2	-1,97E2
Non-re. PER as material	MJ	2,19E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Total use of non-re. PER	MJ	7,56E+02	2,99E+00	2,84E+00	0,00E+00	1,19E+00	9,79E+00	1,98E-2	-1,97E2
Secondary materials	kg	3,45E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	6,37E+00
Renew. secondary fuels	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Non-ren. secondary fuels	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Use of net fresh water	m^3	0.692	6,23E-4	6,84E-4	0,00E+00	2,48E-4	3,21E-3	2,24E-5	-1,47E-1

END OF LIFE – WASTE

Impact category	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
Hazardous waste	kg	1,03E+01	2,91E-3	9,45E-3	0,00E+00	1,16E-3	0,00E+00	3,47E-5	-7,57E0
Non-hazardous waste	kg	3,57E+02	3,22E-1	3,61E-1	0,00E+00	1,28E-1	0,00E+00	8E-2	-6,97E1
Radioactive waste	kg	5,89E-3	2,05E-5	1,85E-5	0,00E+00	8,17E-6	0,00E+00	1,19E-7	-4,8E-4

END OF LIFE – OUTPUT FLOWS

Impact category	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
Components for re-use	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
Materials for recycling	kg	2,73E+00	0,00E+00	1,01E+01	0,00E+00	0,00E+00	1,10E+01	0,00E+00	0,00E+00
Materials for energy rec	kg	3,2E-1	0,00E+00	0,00E+00	0,00E+00	0,00E+00	5E-3	0,00E+00	0,00E+00
Exported energy	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00

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	9,39E-01 kg

NOTE: 1 kg biogenic carbon is equivalent to 44/12 kg of CO_2.

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Halton Rex RXP, 1200

CORE ENVIRONMENTAL IMPACT INDICATORS – EN 15804+A2, PEF

Impact category	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
GWP – total	kg CO_2e	7,01E+01	3,86E-1	1,45E+01	0,00E+00	1,46E-1	2,77E+00	1,59E-3	-4,04E1
GWP – fossil	kg CO_2e	8,17E+01	3,9E-1	4,52E-1	0,00E+00	1,46E-1	2,80E+00	1,58E-3	-4,01E1
GWP – biogenic	kg CO_2e	-1,19E1	2,83E-4	1,41E+01	0,00E+00	1,06E-4	-2,51E-2	1,28E-5	5,69E-3
GWP – LULUC	kg CO_2e	2,71E-1	1,17E-4	2,43E-4	0,00E+00	4,4E-5	1,08E-3	7,59E-7	-3,36E-1
Ozone depletion pot.	kg CFC_{-11}e	7,82E-6	9,17E-8	6,73E-8	0,00E+00	3,44E-8	2,52E-7	4,9E-10	-2,58E-6
Acidification potential	mol H^+e	1,83E+00	1,64E-3	2,27E-3	0,00E+00	6,14E-4	1,16E-2	1,35E-5	-2,95E-1
EP-freshwater[3)]	kg Pe	1,25E-2	3,17E-6	1,14E-5	0,00E+00	1,19E-6	4,69E-5	2,77E-8	-1,91E-3
EP-marine	kg Ne	1,44E-1	4,93E-4	7,27E-4	0,00E+00	1,85E-4	2,53E-3	4,57E-6	-4,01E-2
EP-terrestrial	mol Ne	3,59E+00	5,45E-3	7,77E-3	0,00E+00	2,04E-3	2,89E-2	5,03E-5	-4,86E-1
POCP (“smog”)	kg NMVOCe	5,16E-1	1,75E-3	2,59E-3	0,00E+00	6,57E-4	8,45E-3	1,45E-5	-1,97E-1
ADP-minerals & metals	kg Sbe	8,01E-2	6,65E-6	1,14E-5	0,00E+00	2,5E-6	3,29E-5	1,7E-8	-2,16E-3
ADP-fossil resources	MJ	1,49E+03	6,06E+00	5,70E+00	0,00E+00	2,27E+00	2,04E+01	3,72E-2	-4,2E2
Water use[2)]	m^3e depr.	5,28E+01	2,26E-2	4,46E-2	0,00E+00	8,46E-3	1,93E-1	1,66E-3	-1,71E1

[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 PO_4e.

USE OF NATURAL RESOURCES

Impact category	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
Renew. PER as energy	MJ	1,64E+02	7,63E-2	3,28E-1	0,00E+00	2,86E-2	2,05E+00	6,13E-4	-1,12E2
Renew. PER as material	MJ	1,42E+02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Total use of renew. PER	MJ	3,06E+02	7,63E-2	3,28E-1	0,00E+00	2,86E-2	2,05E+00	6,13E-4	-1,12E2
Non-re. PER as energy	MJ	1,49E+03	6,06E+00	5,70E+00	0,00E+00	2,27E+00	2,04E+01	3,72E-2	-4,2E2
Non-re. PER as material	MJ	3,90E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Total use of non-re. PER	MJ	1,49E+03	6,06E+00	5,70E+00	0,00E+00	2,27E+00	2,04E+01	3,72E-2	-4,2E2
Secondary materials	kg	6,71E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,22E+01
Renew. secondary fuels	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Non-ren. secondary fuels	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Use of net fresh water	m^3	1,37+00	1,26E-3	1,4E-3	0,00E+00	4,74E-4	6,35E-3	4,2E-5	-3,01E-1

END OF LIFE – WASTE

Impact category	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
Hazardous waste	kg	2,05E+01	5,89E-3	1,85E-2	0,00E+00	2,21E-3	0,00E+00	6,51E-5	-1,52E1
Non-hazardous waste	kg	7,65E+02	6,52E-1	7,71E-1	0,00E+00	2,45E-1	0,00E+00	1,5E-1	-1,43E2

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Radioactive waste	kg	1,14E-2	4,16E-5	3,72E-5	0,00E+00	1,56E-5	0,00E+00	2,23E-7	-1,22E-3

END OF LIFE – OUTPUT FLOWS

Impact category	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
Components for re-use	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
Materials for recycling	kg	4,96E+00	0,00E+00	2,31E+01	0,00E+00	0,00E+00	2,11E+01	0,00E+00	0,00E+00
Materials for energy rec	kg	6,12E-1	0,00E+00	0,00E+00	0,00E+00	0,00E+00	5E-3	0,00E+00	0,00E+00
Exported energy	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00

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	2,88 kg

NOTE: 1 kg biogenic carbon is equivalent to 44/12 kg of CO_2.

Halton Rex RE6, 1200

CORE ENVIRONMENTAL IMPACT INDICATORS – EN 15804+A2, PEF

Impact category	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
GWP – total	kg CO_2e	5,58E+01	3,29E-1	1,75E+01	0,00E+00	1,36E-1	2,53E+00	1,59E-3	-3,7E1
GWP – fossil	kg CO_2e	7,20E+01	3,32E-1	1,7E-1	0,00E+00	1,35E-1	2,56E+00	1,58E-3	-3,67E1
GWP – biogenic	kg CO_2e	-1,65E1	2,41E-4	1,73E+01	0,00E+00	9,83E-5	-2,34E-2	1,28E-5	8,21E-3
GWP – LULUC	kg CO_2e	2,29E-1	1E-4	1,93E-4	0,00E+00	4,07E-5	9,93E-4	7,59E-7	-3,03E-1
Ozone depletion pot.	kg CFC_{-11}e	6,83E-6	7,81E-8	2,5E-8	0,00E+00	3,18E-8	2,31E-7	4,9E-10	-2,33E-6
Acidification potential	mol H^+e	1,66E+00	1,4E-3	8,16E-4	0,00E+00	5,69E-4	1,07E-2	1,35E-5	-2,65E-1
EP-freshwater[3)]	kg Pe	1,11E-2	2,7E-6	8,43E-6	0,00E+00	1,1E-6	4,34E-5	2,77E-8	-1,72E-3
EP-marine	kg Ne	1,29E-1	4,21E-4	1,84E-4	0,00E+00	1,71E-4	2,33E-3	4,57E-6	-3,65E-2
EP-terrestrial	mol Ne	3,29E+00	4,65E-3	2,07E-3	0,00E+00	1,89E-3	2,65E-2	5,03E-5	-4,4E-1
POCP ("smog")	kg NMVOCe	4,67E-1	1,49E-3	6,37E-4	0,00E+00	6,09E-4	7,77E-3	1,45E-5	-1,8E-1
ADP-minerals & metals	kg Sbe	7,44E-2	5,67E-6	2,07E-6	0,00E+00	2,31E-6	3,05E-5	1,7E-8	-1,91E-3
ADP-fossil resources	MJ	1,33E+03	5,17E+00	2,93E+00	0,00E+00	2,11E+00	1,87E+01	3,72E-2	-3,83E2
Water use[2)]	m^3e depr.	4,74E+01	1,92E-2	3,07E-2	0,00E+00	7,83E-3	1,76E-1	1,66E-3	-1,56E1

[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 PO_4e.

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USE OF NATURAL RESOURCES

Impact category	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
Renew. PER as energy	MJ	1,38E+02	6,51E-2	2,69E-1	0,00E+00	2,65E-2	1,88E+00	6,13E-4	-1,01E2
Renew. PER as material	MJ	1,76E+02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Total use of renew. PER	MJ	3,14E+02	6,51E-2	2,69E-1	0,00E+00	2,65E-2	1,88E+00	6,13E-4	-1,01E2
Non-re. PER as energy	MJ	1,32E+03	5,17E+00	2,93E+00	0,00E+00	2,11E+00	1,87E+01	3,72E-2	-3,83E2
Non-re. PER as material	MJ	1,22E+01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Total use of non-re. PER	MJ	1,33E+03	5,17E+00	2,93E+00	0,00E+00	2,11E+00	1,87E+01	3,72E-2	-3,83E2
Secondary materials	kg	6,23E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,13E+01
Renew. secondary fuels	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Non-ren. secondary fuels	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Use of net fresh water	m^3	4,31E+04	1,08E-3	7,51E-4	0,00E+00	4,38E-4	5,8E-3	4,2E-5	-2,74E-1

END OF LIFE – WASTE

Impact category	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
Hazardous waste	kg	1,89E+01	5,02E-3	8,17E-3	0,00E+00	2,05E-3	0,00E+00	6,51E-5	-1,39E1
Non-hazardous waste	kg	6,91E+02	5,56E-1	4,81E-1	0,00E+00	2,26E-1	0,00E+00	1,5E-1	-1,29E2
Radioactive waste	kg	1,03E-2	3,55E-5	1,79E-5	0,00E+00	1,45E-5	0,00E+00	2,23E-7	-1,09E-3

END OF LIFE – OUTPUT FLOWS

Impact category	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
Components for re-use	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
Materials for recycling	kg	4,82E+00	0,00E+00	1,65E+01	0,00E+00	0,00E+00	1,955E1	0,00E+00	0,00E+00
Materials for energy rec	kg	5,67E-1	0,00E+00	0,00E+00	0,00E+00	0,00E+00	7E-3	0,00E+00	0,00E+00
Exported energy	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00

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	3,54E kg

NOTE: 1 kg biogenic carbon is equivalent to 44/12 kg of CO_2.

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Halton Rex RE6, 1300

CORE ENVIRONMENTAL IMPACT INDICATORS – EN 15804+A2, PEF

Impact category	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
GWP – total	kg CO_2e	6,44E+01	3,60E-01	1,82E+01	0,00E+00	1,50E-01	2,99E+00	1,70E-03	-4,18E+01
GWP – fossil	kg CO_2e	8,12E+01	3,60E-01	1,80E-01	0,00E+00	1,50E-01	3,02E+00	1,70E-03	-4,14E+01
GWP – biogenic	kg CO_2e	-1,71E+01	2,64E-04	1,80E+01	0,00E+00	1,10E-04	-2,46E-02	1,40E-05	5,00E-04
GWP – LULUC	kg CO_2e	2,77E-01	1,08E-04	2,04E-04	0,00E+00	4,40E-05	1,12E-03	8,10E-07	-3,74E-01
Ozone depletion pot.	kg CFC_{-11}e	7,59E-06	8,40E-08	2,59E-08	0,00E+00	3,50E-08	2,69E-07	5,20E-10	-2,70E-06
Acidification potential	mol H^+e	1,88E+00	1,53E-03	8,45E-04	0,00E+00	6,20E-04	1,22E-02	1,40E-05	-2,98E-01
EP-freshwater[3)]	kg Pe	1,30E-02	2,92E-06	8,74E-06	0,00E+00	1,20E-06	4,78E-05	3,00E-08	-1,90E-03
EP-marine	kg Ne	1,47E-01	4,50E-04	1,88E-04	0,00E+00	1,90E-04	2,65E-03	4,90E-06	-4,15E-02
EP-terrestrial	mol Ne	3,53E+00	5,00E-03	2,13E-03	0,00E+00	2,10E-03	2,97E-02	5,40E-05	-5,11E-01
POCP (“smog”)	kg NMVOCe	5,31E-01	1,56E-03	6,66E-04	0,00E+00	6,60E-04	8,87E-03	1,60E-05	-2,03E-01
ADP-minerals & metals	kg Sbe	7,78E-02	6,10E-06	2,11E-06	0,00E+00	2,50E-06	3,40E-05	1,80E-08	-2,30E-03
ADP-fossil resources	MJ	1,48E+03	5,55E+00	3,06E+00	0,00E+00	2,29E+00	2,16E+01	4,00E-02	-4,40E+02
Water use[2)]	m^3e depr.	5,32E+01	2,09E-02	3,18E-02	0,00E+00	8,50E-03	2,00E-01	1,80E-03	-1,74E+01

[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 PO_4e.

USE OF NATURAL RESOURCES

Impact category	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
Renew. PER as energy	MJ	1,58E+02	7,00E-02	2,76E-01	0,00E+00	2,90E-02	2,14E+00	6,50E-04	-1,21E+02
Renew. PER as material	MJ	1,83E+02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Total use of renew. PER	MJ	3,41E+02	7,00E-02	2,76E-01	0,00E+00	2,90E-02	2,14E+00	6,50E-04	-1,21E+02
Non-re. PER as energy	MJ	1,46E+03	5,55E+00	3,06E+00	0,00E+00	2,29E+00	2,16E+01	4,00E-02	-4,40E+02
Non-re. PER as material	MJ	1,31E+01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Total use of non-re. PER	MJ	1,48E+03	5,55E+00	3,06E+00	0,00E+00	2,29E+00	2,16E+01	4,00E-02	-4,40E+02
Secondary materials	kg	6,88E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,22E+01
Renew. secondary fuels	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Non-ren. secondary fuels	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Use of net fresh water	m^3	1,31E+00	1,16E-03	7,79E-04	0,00E+00	4,80E-04	6,67E-03	4,50E-05	-3,11E-01

END OF LIFE – WASTE

Impact category	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
Hazardous waste	kg	2,12E+01	5,40E-03	8,58E-03	0,00E+00	2,20E-03	0,00E+00	6,90E-05	-1,56E+01
Non-hazardous waste	kg	8,12E+02	6,00E-01	5,02E-01	0,00E+00	2,50E-01	0,00E+00	1,60E-01	-1,46E+02
Radioactive waste	kg	1,13E-02	3,80E-05	1,84E-05	0,00E+00	1,60E-05	0,00E+00	2,40E-07	-1,36E-03

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END OF LIFE – OUTPUT FLOWS

Impact category	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
Components for re-use	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
Materials for recycling	kg	5,08E+00	0,00E+00	1,72E+01	0,00E+00	0,00E+00	2,13E+01	0,00E+00	0,00E+00
Materials for energy rec	kg	6,12E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	7,00E-03	0,00E+00	0,00E+00
Exported energy	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00

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	3,68 kg

Halton Rex RE6, 1400

CORE ENVIRONMENTAL IMPACT INDICATORS – EN 15804+A2, PEF

Impact category	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
GWP – total	kg CO_2e	7,02E+01	3,80E-01	1,88E+01	0,00E+00	1,60E-01	3,24E+00	1,80E-03	-4,43E+01
GWP – fossil	kg CO_2e	8,76E+01	3,80E-01	1,83E-01	0,00E+00	1,60E-01	3,25E+00	1,80E-03	-4,39E+01
GWP – biogenic	kg CO_2e	-1,77E+01	2,76E-04	1,87E+01	0,00E+00	1,10E-04	-2,67E-02	1,40E-05	-2,20E-03
GWP – LULUC	kg CO_2e	2,91E-01	1,14E-04	2,05E-04	0,00E+00	4,70E-05	1,21E-03	8,60E-07	-3,84E-01
Ozone depletion pot.	kg CFC_{-11}e	8,15E-06	8,90E-08	2,72E-08	0,00E+00	3,70E-08	2,94E-07	5,60E-10	-2,85E-06
Acidification potential	mol H^+e	2,04E+00	1,54E-03	8,75E-04	0,00E+00	6,60E-04	1,31E-02	1,50E-05	-3,32E-01
EP-freshwater[3)]	kg Pe	1,42E-02	3,05E-06	9,08E-06	0,00E+00	1,30E-06	5,12E-05	3,10E-08	-2,02E-03
EP-marine	kg Ne	1,58E-01	4,70E-04	2,00E-04	0,00E+00	2,00E-04	2,86E-03	5,20E-06	-4,35E-02
EP-terrestrial	mol Ne	3,83E+00	5,30E-03	2,26E-03	0,00E+00	2,20E-03	3,29E-02	5,70E-05	-5,28E-01
POCP ("smog")	kg NMVOCe	5,77E-01	1,67E-03	6,86E-04	0,00E+00	7,10E-04	9,51E-03	1,60E-05	-2,13E-01
ADP-minerals & metals	kg Sbe	8,44E-02	6,40E-06	2,24E-06	0,00E+00	2,70E-06	3,59E-05	1,90E-08	-2,40E-03
ADP-fossil resources	MJ	1,59E+03	5,86E+00	3,19E+00	0,00E+00	2,44E+00	2,33E+01	4,20E-02	-4,66E+02
Water use[2)]	m^3e depr.	5,74E+01	2,21E-02	3,32E-02	0,00E+00	9,10E-03	2,16E-01	1,90E-03	-1,86E+01

[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 PO_4e.

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USE OF NATURAL RESOURCES

Impact category	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
Renew. PER as energy	MJ	1,71E+02	7,40E-02	2,88E-01	0,00E+00	3,10E-02	2,30E+00	6,90E-04	-1,27E+02
Renew. PER as material	MJ	1,90E+02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Total use of renew. PER	MJ	3,60E+02	7,40E-02	2,88E-01	0,00E+00	3,10E-02	2,30E+00	6,90E-04	-1,27E+02
Non-re. PER as energy	MJ	1,57E+03	5,86E+00	3,19E+00	0,00E+00	2,44E+00	2,33E+01	4,20E-02	-4,66E+02
Non-re. PER as material	MJ	1,39E+01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Total use of non-re. PER	MJ	1,58E+03	5,86E+00	3,19E+00	0,00E+00	2,44E+00	2,33E+01	4,20E-02	-4,66E+02
Secondary materials	kg	7,35E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,30E+01
Renew. secondary fuels	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Non-ren. secondary fuels	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Use of net fresh water	m^3	1,41E+00	1,22E-03	8,19E-04	0,00E+00	5,10E-04	7,09E-03	4,80E-05	-3,26E-01

END OF LIFE – WASTE

Impact category	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
Hazardous waste	kg	2,28E+01	5,70E-03	8,88E-03	0,00E+00	2,40E-03	0,00E+00	7,40E-05	-1,66E+01
Non-hazardous waste	kg	8,79E+02	6,30E-01	5,16E-01	0,00E+00	2,60E-01	0,00E+00	1,70E-01	-1,54E+02
Radioactive waste	kg	1,20E-02	4,00E-05	1,95E-05	0,00E+00	1,70E-05	0,00E+00	2,50E-07	-1,36E-03

END OF LIFE – OUTPUT FLOWS

Impact category	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
Components for re-use	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
Materials for recycling	kg	5,36E+00	0,00E+00	1,78E+01	0,00E+00	0,00E+00	2,27E+01	0,00E+00	0,00E+00
Materials for energy rec	kg	6,62E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	7,00E-03	0,00E+00	0,00E+00
Exported energy	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00

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	3,81 kg

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Halton Rex REE, 1200

CORE ENVIRONMENTAL IMPACT INDICATORS – EN 15804+A2, PEF

Impact category	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
GWP – total	kg CO_2e	6,04E+01	3,83E-1	2,01E+01	0,00E+00	1,58E-1	3,68E+00	9,57E-4	-4,08E1
GWP – fossil	kg CO_2e	7,92E+01	3,86E-1	1,89E-1	0,00E+00	1,58E-1	3,71E+00	9,49E-4	-4,05E1
GWP – biogenic	kg CO_2e	-1,9E1	2,8E-4	1,99E+01	0,00E+00	1,15E-4	-2,7E-2	7,67E-6	2,19E-2
GWP – LULUC	kg CO_2e	2,37E-1	1,16E-4	2,19E-4	0,00E+00	4,76E-5	1,14E-3	4,55E-7	-3,03E-1
Ozone depletion pot.	kg CFC_{-11}e	7,68E-6	9,08E-8	2,78E-8	0,00E+00	3,72E-8	2,65E-7	2,94E-10	-2,46E-6
Acidification potential	mol H^+e	1,87E+00	1,62E-3	9,08E-4	0,00E+00	6,65E-4	1,24E-2	8,09E-6	-2,94E-1
EP-freshwater[3)]	kg Pe	1,24E-2	3,14E-6	9,59E-6	0,00E+00	1,29E-6	4,98E-5	1,66E-8	-1,91E-3
EP-marine	kg Ne	1,43E-1	4,89E-4	2,02E-4	0,00E+00	2E-4	2,73E-3	2,74E-6	-4,07E-2
EP-terrestrial	mol Ne	3,72E+00	5,4E-3	2,28E-3	0,00E+00	2,21E-3	3,11E-2	3,02E-5	-4,93E-1
POCP (“smog”)	kg NMVOCe	5,18E-1	1,74E-3	6,99E-4	0,00E+00	7,11E-4	9,08E-3	8,73E-6	-2,02E-1
ADP-minerals & metals	kg Sbe	8,41E-2	6,59E-6	2,25E-6	0,00E+00	2,7E-6	3,52E-5	1,02E-8	-2,18E-3
ADP-fossil resources	MJ	1,49E+03	6,01E+00	3,27E+00	0,00E+00	2,46E+00	2,14E+01	2,23E-2	-4,13E2
Water use[2)]	m^3e depr.	5,35E+01	2,23E-2	3,38E-2	0,00E+00	9,16E-3	2,03E-1	9,98E-4	-1,78E1

[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 PO_4e.

USE OF NATURAL RESOURCES

Impact category	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
Renew. PER as energy	MJ	1,50E+02	7,56E-2	3,07E-1	0,00E+00	3,1E-2	2,15E+00	3,68E-4	-1,05E2
Renew. PER as material	MJ	2,03E+02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Total use of renew. PER	MJ	3,53E+02	7,56E-2	3,07E-1	0,00E+00	3,1E-2	2,15E+00	3,68E-4	-1,05E2
Non-re. PER as energy	MJ	1,48E+03	6,01E+00	3,27E+00	0,00E+00	2,46E+00	2,14E+01	2,23E-2	-4,13E2
Non-re. PER as material	MJ	1,10E+01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Total use of non-re. PER	MJ	1,49E+03	6,01E+00	3,27E+00	0,00E+00	2,46E+00	2,14E+01	2,23E-2	-4,13E2
Secondary materials	kg	7,49E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,30E+01
Renew. secondary fuels	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Non-ren. secondary fuels	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Use of net fresh water	m^3	1,24E+04	1,25E-3	8,44E-4	0,00E+00	5,12E-4	6,82E-3	2,52E-5	-3,04E-1

END OF LIFE – WASTE

Impact category	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
Hazardous waste	kg	2,09E+01	5,84E-3	9,07E-3	0,00E+00	2,39E-3	0,00E+00	3,91E-5	-1,55E1
Non-hazardous waste	kg	7,72E+02	6,46E-1	5,44E-1	0,00E+00	2,65E-1	0,00E+00	9E-2	-1,44E2
Radioactive waste	kg	1,18E-2	4,12E-5	2,02E-5	0,00E+00	1,69E-5	0,00E+00	1,34E-7	-1,09E-3

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END OF LIFE – OUTPUT FLOWS

Impact category	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
Components for re-use	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
Materials for recycling	kg	5,68E+00	0,00E+00	1,89E+01	0,00E+00	0,00E+00	2,25E+01	0,00E+00	0,00E+00
Materials for energy rec	kg	6,62E-1	0,00E+00	0,00E+00	0,00E+00	0,00E+00	4,63E-1	0,00E+00	0,00E+00
Exported energy	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00

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	4,08 kg

NOTE: 1 kg biogenic carbon is equivalent to 44/12 kg of CO_2.

Scenario documentation

MANUFACTURING ENERGY SCENARIO DOCUMENTATION

Energy type	Object	GWP value	Data quality	Representativeness
Electricity	Electricity data quality and CO_2 emission kg CO_2 eq. / kWh	0.0122 kg CO_2e / kWh	Electricity production, nuclear, boiling water reactor, Finland EN15804+A1, EN15804+A2, 2019. Ecoinvent 3.6	The processes included in the data set are well representative for the geography (Finland) Equivalent processes: Technology aspects are very similar to what is described
Biogas, heating	Produced heat data quality and CO_2 emissions kg CO_2 eq. / MJ	0.0113 kg CO_2e / MJ	Heat and power co-generation, biogas, gas engine (Reference product: heat, central or small-scale, other than natural gas), Finland, EN15804+A1, EN15804+A2, 2019, Ecoinvent 3.6	The processes included in the data set are well representative for the geography (Finland) Equivalent processes: Technology aspects are very similar to what is described

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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/m^3)	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)	Disposable gloves (not included in the analysis because of their insignificant usage amount)
Water use	0 m^3
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 Polyethylene (PE) kg Wood pallet

END-OF-LIFE SCENARIO; Halton Rex RXP and Halton Rex RE6

			RXP	RE6
		Material	**Min-Max**	**Min-Max**
Process flow	**Size(mm)**		600mm - 1200mm	1200mm - 3600mm
Collection process specified by type	kg collected separately		11 – 21 kg	19,6 – 55,2 kg
	kg collected with mixed construction waste			
Recovery system specified by type	kg for reuse			
	kg for recycling	Steel Copper Aluminium	9,44 – 17,36 kg 0,75 – 1,64 kg 0,82 – 2,05 kg	16,22 – 43, 03 kg 1,49 – 5,22 kg 1,85 – 6,97 kg
	kg for energy recovery	Polyethylene PE PVC	0,001 kg 0,004 kg	0,004 kg 0,003 kg
Disposal specified by type	kg material for final deposition	Polymer	0,08 – 0,15 kg	0,15 – 0,41 kg
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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END-OF-LIFE SCENARIO; HALTON REX REE

			REE
Material			
Process flow	**Size(mm)**		1200mm – 4800mm
Collection process specified by type	kg collected separately		22,94 – 73,99
	kg collected with mixed construction waste		
Recovery system specified by type	kg for reuse		
	kg for recycling	Steel Copper Aluminium	18,94 – 57,23 kg 1,69 – 7,06 kg 1,85 – 9,23 kg
	kg for energy recovery	Polyethylene PE PVC	0,46 kg 0,003 kg
Disposal specified by type	kg material for final deposition	Polymer	0,09 – 0,31 kg
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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ANNEX 1: SUMMARY OF PRODUCT CARBON FOOTPRINT RESULTS

Global warming potential, GWP total

Halton Rex RXP	Product size mm	GWP Total $kgCO_2e$ per unit
RXP	600	43,7
RXP	1200	87,9
Halton Rex RE6	**Product size mm**	**GWP Total $kgCO_2e$ per unit**
RE6	1200	76,3
RE6	1300	86,10
RE6	1400	92,78
RE6	1500	99,4
RE6	1600	106,0
RE6	1700	112,7
RE6	1720	114,0
RE6	1800	119,3
RE6	1900	125,9
RE6	2000	132,5
RE6	2100	139,2
RE6	2200	145,8
RE6	2300	152,4
RE6	2400	159,1
RE6	2500	165,7
RE6	2600	172,3
RE6	2700	178,9
RE6	2800	185,6
RE6	2900	192,2
RE6	3000	198,8
RE6	3100	205,4
RE6	3200	212,1
RE6	3300	218,7
RE6	3400	225,3
RE6	3500	232,0
RE6	3600	238,6

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Global warming potential, GWP total

Halton Rex REE	Product size mm	GWP Total $kgCO_2e$ per unit
REE	1200	84,7
REE	1300	85,4
REE	1400	91,9
REE	1500	98,5
REE	1600	105,1
REE	1700	111,6
REE	1800	118,2
REE	1900	124,8
REE	2000	131,3
REE	2100	137,9
REE	2200	144,4
REE	2300	151,0
REE	2400	157,6
REE	2500	164,1
REE	2600	170,7
REE	2700	177,3
REE	2800	183,8
REE	2900	190,4
REE	3000	197,0
REE	3100	203,5
REE	3200	210,1
REE	3300	216,7
REE	3400	223,2
REE	3500	229,8
REE	3600	236,4
REE	3700	242,9
REE	3800	249,5
REE	3900	256,1
REE	4000	262,6
REE	4100	269,2
REE	4200	275,8
REE	4300	282,3
REE	4400	288,9
REE	4500	295,5
REE	4600	302,0
REE	4700	308,6
REE	4800	315,2

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ANNEX 2: EPD RESULTS BY RTS PCR REQUIREMENTS

Halton Rex RXP, 600

Impact category	Unit	A1-A3	A4	A5	C2	C3	D
Global Warming Potential total	kg CO_2e/kg	1,74E+00	8,85E-03	2,25E-01	3,59E-03	6,08E-02	-9,22E-01
Abiotic depletion potential (ADP-elements) for non-fossil	kg Sbe/kg	1,88E-03	1,54E-07	2,99E-07	6,06E-08	7,94E-07	-4,63E-05
Abiotic depletion potential (ADP-fossil fuels) for fossil resources (+A2)	MJ/kg	3,53E+01	1,39E-01	1,32E-01	5,55E-02	4,57E-01	-9,17E+00
Water use	m^3e depr./kg	1,23E+00	5,22E-04	9,93E-04	2,05E-04	4,60E-03	-4,08E-01
Biogenic carbon content in product	kg C/kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Use of secondary materials	kg/kg	1,61E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	2,97E-01

Halton Rex RE6, 1400

Impact category	Unit	A1-A3	A4	A5	C2	C3	D
Global Warming Potential total	kg CO_2e/kg	3,05E+00	1,65E-02	8,18E-01	6,95E-03	1,41E-01	-1,92E+00
Abiotic depletion potential (ADP-elements) for non-fossil resources	kg Sbe/kg	3,66E-03	2,78E-07	9,73E-08	1,17E-07	1,56E-06	-1,04E-04
Abiotic depletion potential (ADP-fossil fuels) for fossil resources (+A2)	MJ/kg	6,89E+01	2,55E-01	1,39E-01	1,06E-01	1,01E+00	-2,02E+01
Water use	m^3e depr./kg	2,49E+00	9,60E-04	1,44E-03	3,95E-04	9,38E-03	-8,06E-01
Biogenic carbon content in product	kg C/kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Use of secondary materials	kg/kg	3,19E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	5,65E-01

Halton Rex REE, 1200

Impact category	Unit	A1-A3	A4	A5	C2	C3	D
Global Warming Potential total	kg CO_2e/kg	2,60E+00	1,64E-02	8,67E-01	6,89E-03	1,58E-01	-1,76E+00
Abiotic depletion potential (ADP-elements) for non-fossil resources	kg Sbe/kg	3,61E-03	2,84E-07	9,82E-08	1,16E-07	1,52E-06	-9,20E-05
Abiotic depletion potential (ADP-fossil fuels) for fossil resources (+A2)	MJ/kg	6,43E+01	2,59E-01	1,41E-01	1,06E-01	9,23E-01	-1,78E+01
Water use	m^3e depr./kg	2,30E+00	9,69E-04	1,47E-03	3,96E-04	8,75E-03	-7,67E-01

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Biogenic carbon content in product	kg C/kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Use of secondary materials	kg/kg	3,22E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	5,59E-01

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ANNEX 3: EPD CONVERSION TABLES FOR SPECIFIC LCIA INDICATORS

Halton Rex RE6

The results of other product sizes for specific LCIA Indicators that do not scale accordingly with generic calculation formula within 10 % rule can be scaled with the help of the following formula:

$$Results\ per\ Halton\ Rex\ RE6 = LCIA\ Results\ for\ RE6\ 1400 * \frac{Length\ mm}{1400\ mm} * specific\ conversion\ factor$$

Specific conversion factors are presented in following table:

Halton Rex RE6	Product size mm	Materials for energy recovery kg	Total use of renewable primary energy	Use of renewable primary energy resources as raw materials MJ
RE6	1200	1	1	1
RE6	1300	1	1	1
RE6	1400	1	1	1
RE6	1500	1	1	1
RE6	1600	1	1	1
RE6	1700	1	1	1
RE6	1720	1	1	1
RE6	1800	1	1	1
RE6	1900	1	1	1
RE6	2000	1	1	1
RE6	2100	1	1	1
RE6	2200	1	1	1
RE6	2300	1	1	1
RE6	2400	0,9	0,9	0,79
RE6	2500	0,9	0,9	0,79
RE6	2600	0,9	0,9	0,79
RE6	2700	0,9	0,9	0,79
RE6	2800	0,9	0,9	0,79
RE6	2900	0,9	0,9	0,79
RE6	3000	0,9	0,9	0,79
RE6	3100	0,9	0,9	0,79
RE6	3200	0,9	0,9	0,79
RE6	3300	0,9	0,9	0,79
RE6	3400	0,9	0,9	0,79
RE6	3500	0,9	0,9	0,79
RE6	3600	0,84	0,84	0,69

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Halton Rex REE

The results of other product sizes for specific LCIA Indicators that do not scale accordingly with generic conversion factor within 10 % rule can be scaled with the help of the following formula:

$$Results\ per\ \ REE\ = LCIA\ Results\ for\ \ REE\ 1200 * \frac{Length\ mm}{1200\ mm} * specific\ conversion\ factor$$

Specific conversion factors are presented in following table. For other LCIA Indicators, conversion factor 0,93 can be used as a generic conversion factor.

Halton Rex REE	Product size mm	GWP Biogenic	Materials for recycling kg	Materials for energy recovery kg	Total use of renewable primary energy	Use of renewable primary energy resources as raw materials MJ
REE	1200	1,00	1,0	1,0	1,0	1,0
REE	1300	1,02	0,96	0,95	0,97	0,95
REE	1400	1,01	0,94	0,92	0,96	0,93
REE	1500	0,99	0,92	0,90	0,94	0,90
REE	1600	0,98	0,90	0,88	0,92	0,87
REE	1700	0,96	0,88	0,85	0,91	0,84
REE	1800	0,95	0,87	0,83	0,89	0,81
REE	1900	0,93	0,85	0,80	0,87	0,79
REE	2000	0,92	0,83	0,78	0,86	0,76
REE	2100	0,91	0,82	0,77	0,85	0,75
REE	2200	0,90	0,81	0,76	0,84	0,73
REE	2300	0,89	0,80	0,74	0,83	0,72
REE	2400	0,88	0,80	0,73	0,83	0,71
REE	2500	0,88	0,79	0,72	0,82	0,69
REE	2600	0,87	0,78	0,71	0,81	0,68
REE	2700	0,858	0,77	0,70	0,804	0,665
REE	2800	0,85	0,77	0,69	0,798	0,657
REE	2900	0,84	0,76	0,68	0,793	0,65
REE	3000	0,83	0,76	0,67	0,787	0,64
REE	3100	0,82	0,75	0,67	0,782	0,63
REE	3200	0,81	0,74	0,66	0,777	0,63
REE	3300	0,80	0,74	0,65	0,771	0,62
REE	3400	0,79	0,73	0,64	0,766	0,61
REE	3500	0,79	0,73	0,64	0,76	0,60
REE	3600	0,79	0,72	0,63	0,76	0,60
REE	3700	0,79	0,72	0,62	0,76	0,59

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Halton Rex REE	Product size mm	GWP Biogenic	Materials for recycling kg	Materials for energy recovery kg	Total use of renewable primary energy	Use of renewable primary energy resources as raw materials MJ
REE	3800	0,79	0,71	0,62	0,75	0,59
REE	3900	0,79	0,71	0,61	0,75	0,58
REE	4000	0,79	0,70	0,61	0,75	0,58
REE	4100	0,79	0,70	0,60	0,74	0,57
REE	4200	0,78	0,70	0,60	0,74	0,57
REE	4300	0,78	0,69	0,59	0,74	0,57
REE	4400	0,77	0,69	0,59	0,74	0,56
REE	4500	0,77	0,69	0,59	0,73	0,56
REE	4600	0,76	0,68	0,58	0,73	0,55
REE	4700	0,75	0,68	0,58	0,73	0,55
REE	4800	0,75	0,68	0,58	0,73	0,55

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