epddanmark

ECO PLATFORM EPD VERIFIED

Owner:	VOLA A/S
No.:	MD-23147-EN_rev1
Issued:	18-12-2024
Revision:	05-02-2025
Valid to:	18-12-2029

3rd PARTY **VERIFIED**

EPD

VERIFIED ENVIRONMENTAL PRODUCT DECLARATION | **ISO 14025 & EN 15804**

Owner of the declaration

VOLA A/S
Lunavej 2
8700 Horsens
Denmark
VAT no.: 17531328

Programme

EPD Danmark
www.epddanmark.dk

☐ Industry EPD
☒ Product EPD

Declared products

6 products:

321L-16
321-19
321L-40
321-27
321L-60
321L-64

Production site

VOLA A/S
Lunavej 2
8700 Horsens
Denmark

Product(s) use

VOLA fixtures are used in kitchens and bathrooms.

Declared/ functional unit

1 fixture with RSL of 30 years

Year of data

2022

EPD version

The first issue.

Issued: 18-12-2024

Valid to: 18-12-2029

Basis of calculation

This EPD is developed in accordance with the European standard EN 15804+A2.

Comparability

EPDs of construction products may not be comparable if they do not comply with the requirements in EN 15804. EPD data may not be comparable if the datasets used are not developed in accordance with EN 15804 and if the background systems are not based on the same database.

Validity

This EPD has been verified in accordance with ISO 14025 and is valid for 5 years from the date of issue.

Use

The intended use of an EPD is to communicate scientifically based environmental information for construction products, for the purpose of assessing the environmental performance of buildings.

EPD type

☐Cradle-to-gate with modules C1-C4 and D
☐Cradle-to-gate with options, modules C1-C4 and D
☒Cradle-to-grave and module D
☐Cradle-to-gate
☐Cradle-to-gate with options

CEN standard EN 15804 serves as the core PCR

Independent verification of the declaration and data, according to EN ISO 14025

☐ internal ☒ external

Third party verifier:

Charlotte B. Merlin

Martha Katrine Sørensen
EPD Danmark

Life cycle stages and modules (MND = module not declared)																
Product			Construction process		Use							End of life				Beyond the system boundary
Raw material supply	Transport	Manufacturing	Transport	Installation process	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction demolition	Transport	Waste processing	Disposal	Re-use, recovery, and recycling potential
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

Product information

Product description

The main product components are shown in Table 1. Values are given as intervals covering the eight products with six different surfaces. Specific recipes are used, and the composition of input materials is 100 % in mass -% of declared products.

Table 1: Material composition of products

Material	Amount [%]
Brass	57,49 – 72,70
Ceramics	0,31 – 0,37
Other metals	2,17 – 2,91
Plastic	2,44 – 2,80
Rubber	0,02 – 0,82
Steel	0,24 – 12,97
Hot dip galvanised steel	20,98 – 24,85
Other	0,06 - 0,09

Product packaging:

The composition of the product's sales and transport packaging is shown in the table below.

Table 2: Material composition of Sales and Transport Packaging for the final VOLA product

Material	Amount [%]
LDPE	1,70
Cardboard	94,36
Paper	3,93
Wooden pallet	0,01
Total	**100**

Representativity

This declaration, including data collection and the modeled foreground system including results, represents the production of 1 fixture from VOLA on the production site located in Denmark. Product-specific data are based on average values covering the period from 01.01.2022 to 31.12.2022. Background data are based on SimaPro 9.3 and are less than 10 years old. Only in a few cases are SimaPro 9.3 data supplemented with data from Ecoinvent 3.9.1 (2023).

Generally, the used background datasets are of high quality, and the majority of the datasets are only a few years old. VOLA buys certified electricity produced from wind energy in the period 1.1.2022-31.12.2022.

Hazardous substances

Declared products do not contain substances listed in the" Candidate List of Substances of Very High Concern for authorization" with the exception of lead contained in brass with a concentration above 0,1 %.

(http://echa.europa.eu/candidate-list-table)

Essential characteristics

There is no harmonized specification, but VOLA produces products according to relevant product standards. Components that are in contact with water are produced in lead-free brass, according to 4MS and California Assembly Bill AB1953. Components in stainless steel are produced in the material according to EN10088-3:2014 and AISI316 (American Iron and Steel Institute).

Further technical information can be obtained by contacting the manufacturer or on the manufacturer's website:

http://www.vola.com

Reference Service Life (RSL)

A reference service life (RSL) for all products is declared for 30 years. The lifespan of products has been provided by the manufacturer VOLA based on "BUILD REPORT 2021" Version 2021 – lifetime tables: Group 43 (3) = lifetime of 30 years (BUILD REPORT 2021).

Eighteen products (111, 111L, 111M, 112, 112L, 112M, 121, 121L, 121M, 122, 122L, 122M, 311, 311L, 311M, 321, 321L, 321M) are calculated in seven different surfaces (16 and 20, 19, 40, 27, 60, 64) and six product groups, see **Error! R eference source not found.**, Figure 3, and Figure 4. In the EPD the declared products are the worst-case product for each of the different product categories.

Figure 1: 111, 111M, 111L, 112, 122M, 112L

Figure 2: 121, 121M, 121L, 122, 122M, 122L

Figure 3: 311, 311M, 311L

Figure 4: 321, 321M, 321L

Group 4 called "Colors" have more surfaces: Grey (02), Blue (04), Orange (05), Light green (06), Yellow (08), Dark grey (09), Mocca (12), Bright red (14), Dark blue (15), Gloss black (17), Gloss white (18), Carmine red (21), Pink (25), Matt black (27), and Matt white (28).

Group 5 called "Exclusive color with PVD on Brass" have also more surfaces: Black (60), Deep black (62), Copper (63), Gold (65), and Nickel (68).

Group 6 called "Exclusive color with PVD on Stainless steel" have also more surfaces: Brushed black (61), Brushed copper (64), Brushed gold (70), and Dark brushed copper (71).

LCA background

Declared unit

The declared unit is taken as the input of materials in order to produce 1 fixture.

The LCI and LCIA results in this EPD relate to 1 fixture from VOLA for the types: 111, 111L, 111M, 112, 112L, 112M, 121, 121L, 121M, 122, 122L, 122M, 311, 311L, 311M, 321, 321L and 321M.

Table 3, Table 4 and Table 5 show declared units for 6 product groups with 7 different surfaces (16 and 20, 19, 40, 27, 60, 64) and 6 different variations of products (321L-16, 321-19, 321L-40, 321-27, 321L-60, 321L-64)

The results for:

- Group no. 1 refers to Table 8 to Table 12
- Group no. 2 refers to Table 13 to Table 17
- Group no. 3 refers to Table 18 to Table 22
- Group no. 4 refers to Table 23 to Table 27
- Group no. 5 refers to Table 28 to Table 32
- Group no. 6 refers to Table 33 to Table 37

Table 3: Declared Unit -part 1.

Group no.	Surface/Material		Surface no.	Name / Value								Conversion factor to 1 kg
				111	111L	111 M	112	112L	112 M	121	121L	
				[kg/piece]								
1	Polished and brushed chrome	Polished chrome Brushed chrome	16 20	3,25	3,30	3,28	3,33	3,37	3,35	3,29	3,34	0,28
2	Natural brass	Natural brass	19	3,26	3,30	3,28	3,33	4,00	3,98	3,29	3,96	0,26
3	Stainless steel	Stainless steel	40	3,26	3,36	3,35	3,32	3,42	3,41	3,31	3,41	0,27
4	Colors	Matt black	27	3,32	3,35	3,34	-	4,05	3,41	3,34	3,38	0,26
5	Exclusive color (PVD on Brass)*	Black	60	3,34	3,38	3,37	3,40	3,45	3,43	3,38	3,43	0,27
6	Exclusive color (PVD on Stainless steel)	Brushed copper	64	3,34	3,44	3,42	3,39	3,49	3,47	3,39	3,49	0,26
Declared unit				1								0,26-0,28

* PVD (physical vapor deposition) is a method like coating spray.

Table 4: Declared Unit - part 2.

Group no.	Surface/Material		Surface no.	Name / Value								Conversion factor to 1 kg
				121M	122	122L	122M	-	-	-	-	
				[kg/piece]								
1	Polished and brushed chrome	Polished chrome Brushed chrome	16 20	3,32	3,36	3,41	3,39	-	-	-	-	0,28
2	Natural brass	Natural brass	19	3,32	3,36	4,03	4,01	-	-	-	-	0,26
3	Stainless steel	Stainless steel	40	3,39	3,37	3,47	3,45	-	-	-	-	0,27
4	Colors	Matt black	27	3,36	3,42	4,08	4,06	-	-	-	-	0,26
5	Exclusive color (PVD on Brass)	Black	60	3,41	3,45	3,49	3,47	-	-	-	-	0,27
6	Exclusive color (PVD on Stainless steel)	Brushed copper	64	3,48	3,45	3,55	3,53	-	-	-	-	0,26
Declared unit				1								0,26-0,28

Table 5: Declared Unit – part 3.

Group no.	Surface/Material		Surface no.	Name / Value						Conversion factor to 1 kg
				311	311L	311M	321	321L	321M	
				[kg/piece]						
1	Polished and brushed chrome	Polished chrome	16	4,11	4,16	4,14	4,15	4,19	4,17	0,28
		Brushed chrome	20							
2	Natural brass	Natural brass	19	4,74	4,17	4,14	4,77	4,77	4,20	0,26
3	Stainless steel	Stainless steel	40	4,12	4,22	4,20	4,17	4,27	4,25	0,27
4	Colors	Matt black	27	4,80	4,23	4,21	4,82	4,82	4,25	0,26
5	Exclusive color (PVD on Brass)	Black	60		4,24	4,22	4,86	4,91	4,89	0,27
6	Exclusive color (PVD on Stainless steel)	Brushed copper	64	4,20	4,30	4,28	4,87	4,98	4,96	0,26
Declared unit				1						0,26-0,28

PCR

This EPD is developed according to the core rules for the product category of construction products in EN 15804, and Part B/ PCR-Part B: Requirements on the EPD for Bathroom and showers.

Guarantee of Origin – certificates

Foreground system:

The product is produced using electricity from wind energy sources covered by GO for the EPD validity period. The LCA is modelled with electricity from wind energy.

Background system:

Upstream and downstream processes are modelled using a European electricity grid mix. This choice is made because data for the generation of electricity used in modules B-D shall be based on the electricity consumption mix on the market.

Flow diagram

The Flow diagram (Figure 5) conforms with the requirements of the modular approach and shows all phases. All phases are described below.

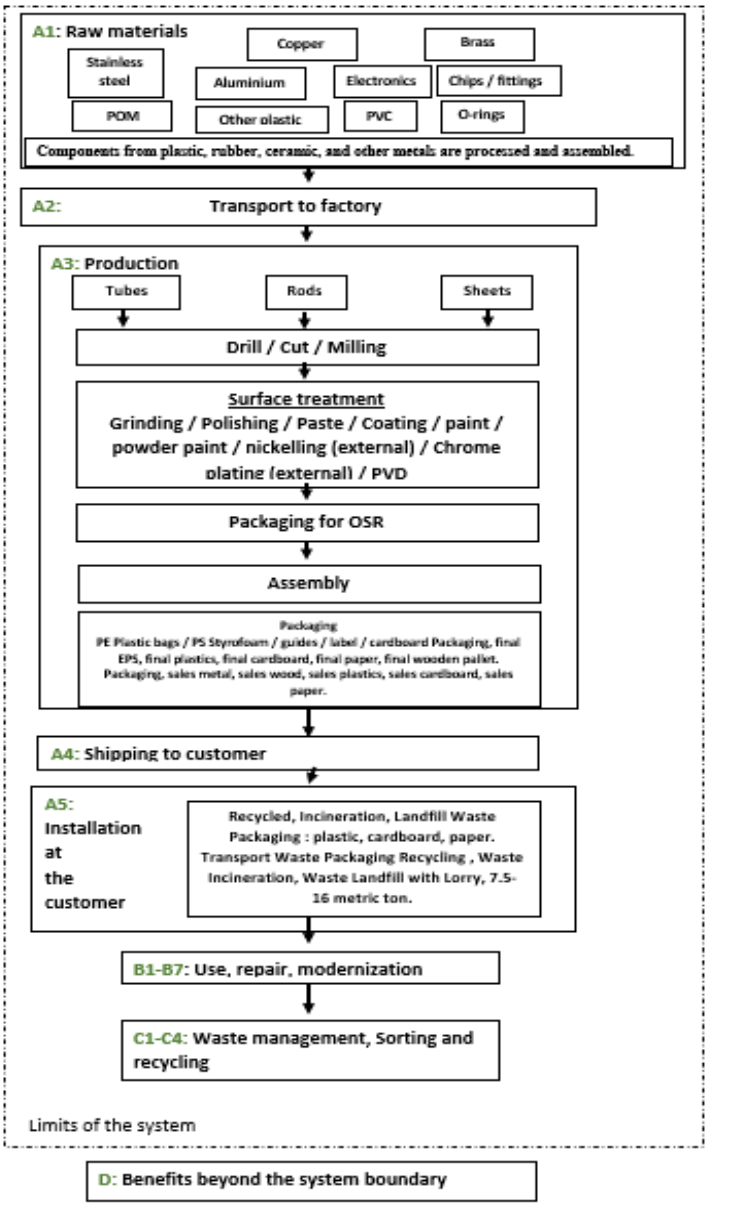

Figure 5: Flow diagram of product system with modules A1-D

System boundary

This EPD is based on a cradle-to-grave LCA, in which 100 weight-% have been accounted for.

The general rules for the exclusion of inputs and outputs follow the requirements in EN 15804, 6.3.5, where the total of neglected input flows per module shall be a maximum of 5 % of energy usage and mass and 1 % of energy usage and mass for unit processes.

Product stage (A1-A3) includes:

This product stage includes the acquisition of all raw materials, products, and energy, transport to the production site, packaging, and waste processing up to the "end-of-waste" state or final disposal. The LCA results are declared in aggregated form for the product stage, which means, that the sub-modules A1, A2, and A3 are declared as one module A1-A3. The manufacturing process is taken place in Denmark.

A1: Extraction and processing of raw materials

VOLA uses high quality steel and brass to make sure the products are built to last. Components from plastic, rubber, ceramic, and other metals are reproduced from suppliers.

The materials that are used to pack all raw materials are metal strips, cardboard, paper, wood, and plastic.

A2: Transport to the production site in Horsens, Denmark

The raw materials are transported to the manufacturing site. The modelling includes road and/or flight transportation of each raw material. The transportation of all raw materials is by trucks.

A3: Manufacturing processes

The production of packaging materials is taken into account at this stage. The processing of any waste arising from this stage is also included. The main raw material is stainless steel and brass. These materials constitute 25-73 % of the total product. Stainless steel components have different qualities: 304L and 316L. The brass components are of different qualities: CW508L, CW511L, CW602N, CW608N, CW614N, and Eco Brass. The rest of the components are mainly made of different kinds of rubber and plastic materials.

From solid brass/stainless steel rods or pipes, components are rotated, drilled, or milled on CNC machines. Subsequently, the components are ground/polished to create a unique surface, either by manual or automatic processes. Some components are hand-soldered or soldered by induction. The finished polished components are treated with a surface finish depending on the finish the customer wishes. Production is based on LEAN-production, where stocks are minimized and where products are put into production as soon as they are sold (Make to order, MTO).

The wooden pallets for the transportation of products are part of a return system, and therefore only 1/25 is accounted for due to the 25 times reuse rate.

The colored surfaces in product group no 4. and 8. represented by surface no. 27 also include powder coating material. Powder coating waste from production is 45 %.

The steel waste from production is 64-69 % for groups no. 3, 6, and 10; 75-77 % of steel waste is from groups no. 4 and 8; and 0 % from groups no. 1, 2, 5, and 7.

The brass waste from production is 44-46 % for groups no. 3 and 6; 51-56 % of brass waste is from groups no. 1, 2, 4, 5, 7, 8 and 10.

The waste of brass, steel, and powder coating during manufacturing processes is recycled and transported by lorry to the sorting and collecting center.

In this phase, the disposal of raw material packaging is considered. Waste packaging from raw materials (paper, cardboard, wood, metal) is transported to a sorting and collection center, where 100 % recycling is expected.

Transportation to the sorting and collecting center is covered by a European average EURO 5 lorry 16 t with a diesel engine, and distance to the recycling and incineration station is covered by a European average EURO 5 lorry >32 tons with a diesel engine.

The construction process stage (A4-A5) includes:

A4: Transportation from the VOLA production site in Horsens, Denmark to customers

Distribution to customers is based on the current European market situation and takes into account not only the current fleet mix with primarily Euro 5 vehicles but also vehicle loading with an average of 5 t and effective distances, see Table 52. It is implemented within Europe using diesel-powered trucks. Some products were not sold in the target market in 2022, therefore the average transport distance (879 km) of all products was used as a conservative solution.

A5: Installation of products

Installation is simple and does not require any relevant energy consumption or use of materials, due to manual installation by technicians. Mounting instructions are included with the product or can be downloaded on: www.VOLA.com. Apart from the waste of sales and transport packaging for the final VOLA product (paper, cardboard, and plastics), no additional material flows are generated during installation.

Overall, 74,3 % of Sales and Transport Packaging for the final VOLA product is recycled, 11,6 % is transported to the landfill, and 14,1 % is incinerated, with the potential benefits reported in module D. Waste packaging materials are transported 300 km to the recycling center, 100 km to the incineration station, and 50 km to the landfill. Transportation is covered by a European average EURO 5 lorry 16 t with a diesel engine.

Use stage (B1-B7) includes:

B1: Use

The product has a reference service life of a minimum of 30 years. This determined that the product would last at least 30 years provided that the requirements for maintenance and repair throughout this period are kept. The lifespan of products has been provided by the manufacturer, VOLA. This LCA phase scenario includes a use stage based in Europe. There are no direct emissions from the use of VOLA products.

B2: Maintenance

VOLA has declaimed this maintenance information. Maintenance instructions are part of the VOLA product, which also be downloaded at: www.VOLA.com. Waste packaging materials resulting from the maintenance are omitted.

B3: Repair

The product is made of a few parts that can easily be changed and replaced by new parts. The service interval for the VOLA parts depends on use and water quality scenarios. The estimated service interval is approx. 10 years. Parts that are calculated for repair are hoses, cartridges, and pilators. This module includes the waste handling of the disposed parts, with the potential benefits reported in module D.

VOLA guarantees that it is possible to get spare parts a minimum of 30 years from the day the product is ordered. Service drawing is available on: www.VOLA.com

B4: Replacement

There is no calculated replacement due to the declaration for a product life of 30 years.

B5: Refurbishment

No refurbishment is considered within 30 years.

(B6-B7) Consumption data

This use stage consists of energy and water consumption for the users with an assumption to be used in bathrooms and kitchens for 30 years. The water use calculation follows the formula provided in the reference PCR. Water and energy consumption are based on the European market.

The actual amount of water that is consumed during use partly depends on user behaviour. The technical operating scenario is available in Table 6, and Table 7.

The spouts 010 and 020 have the flow rate of 1,9 l/min of water consumption by using aerators, an average of 20 cycles per day, and a cycle time of 30 seconds, while the spouts 030 have the flow rate 3,5 l/min of water consumption by using flow restrictor at the spout connection an average of 20 cycles per day, and a cycle time of 30 seconds. Series 100 for basin and kitchen can be mounted with different spouts (010 – 020-030). This EPD applies only to spouts 010, 020. This is due to the big variation compared to spouts 030 in operational water use (module B7) caused by higher water consumption of sprouts 030.

Table 6: Consumption Data for spouts 010 and 020 - cycle time (1,9 l/min) in the use stage - Operational energy use and water use

1,9 l/min water-saving aerators and Cycle time Settings of 30 sec.								
Use scenario		Intensity of use			Water consumption		Energy consumption	
		Per day	Per year	Per RSL	[Litres] per year	[Litres] per RSL	[kWh] per year	[kWh] per RSL
Average building	0,95 liters per use	20	7.300	219.000	6.935	208.050	0	0

Table 7: Construction data

Name	Value	Unit
Maximum load temperature permanent operation	60	°C
Maximum load temperature temporary operation	70	°C
Flow rate (indications for a pressure range of 1-3 bar)	0,3	m^3/h
Sound emissions	0-20	dB

End of Life (C1-C4) includes:

The end-of-life stage consists of the deconstruction/demolition, transport, waste management, and disposal processes to manage the product as waste after the use phase of 30 years life span. The generated waste in modules C1-C4 is included up to the "end-of-waste" state or final disposal, with the potential net benefits reported in module D. The end-of-life stage is based on the European market.

C1: Deconstruction, Demolition

For the demolition of water basin mixers, the energy consumption is 0,1 kWh. The electricity is based on the European grid mix.

C2: Transport

This stage includes the transportation of demolished products. 1,2- 1,5 % of product parts are transported 100 km to the incineration station, 92,1-92,7 % of the product is recycled and transported 300 km, and 6,3-6,7 % of the product is transported 50 km to the landfill. Transport is covered by a European average EURO 5 lorry 16 t with a diesel engine.

C3: Waste Processing

The end-of-life stage represents the waste scenario after a use stage where 1,2-1,7 % of the product parts are incinerated in module C3 with energy recovery accounted for in module D. Overall, 91,7-92,6 % of the product is recycled with material recovery accounted for in module D.

C4: Disposal

Overall, 6,3-6,7 % of the product is transported to a landfill.

Re-use, recovery and recycling potential (D) includes:

Module D includes reuse, recovery, and/or recycling potential, expressed as net impact and benefits, due to reuse, recycling, and incineration of materials with energy recovery in modules A5, B3, and C3. The reused components made from raw materials in the product stage were assumed to replace similar components from raw materials. The plastic and rubber parts of the product are assumed to be incinerated at the end-of-life stage in module C3, whereas an energy recovery (75 % heat, 25 % electricity) and energy efficiency (80 % for heat, 25 % for electricity) from the incineration process is accounted for in module D.

LCA results

The variation in environmental impact caused between products within the same groups lies in the base material amount i.e. steel, brass and the hot dip galvanisation steel treatment, and not in the product manufacturing. Therefore, the potential environmental impacts per surface treatments (no. 1-10) are presented in the next page. The potential environmental impact variation between the products and colors is below 10 % within the ten groups, thus justifying their grouping in one group and represented by the results of one product.

Group no. 1. Polished and brushed chrome, represented by 321L-16 – Polished chrome

Group no. 2. Natural brass, represented by 321-19 – Natural brass

Group no. 3. Stainless steel, represented by 321L-40 – Stainless steel

Group no. 4. Colors, represented by 321-27 – Matt black

Group no. 5. Exclusive color (PVD on Brass), represented by 321L-60 – Black

Group no. 6. Exclusive color (PVD on Stainless steel), represented by 321L-64 – Brushed copper

Group 1: Polished and brushed chrome is represented by 321L-16

Table 8: Environmental impact indicators - Group 1.

ENVIRONMENTAL IMPACTS PER FIXTURE																
Parameter	**Unit**	**A1-A3**	**A4**	**A5**	**B1**	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**C1**	**C2**	**C3**	**C4**	**D**
GWP- total	kg CO_2-eq.	4,17E+01	2,05E+00	6,35E-01	0,00E+00	8,93E+00	6,25E-01	0,00E+00	0,00E+00	0,00E+00	6,54E+01	3,67E-02	2,77E-01	1,60E-01	1,91E-02	-2,90E-01
GWP-fossil	kg CO_2-eq.	4,16E+01	2,05E+00	1,39E-01	0,00E+00	1,59E+01	5,97E-01	0,00E+00	0,00E+00	0,00E+00	6,39E+01	3,54E-02	2,77E-01	1,55E-01	7,54E-03	-2,71E-01
GWP-biogenic	kg CO_2-eq.	-3,59E-01	0,00E+00	4,76E-01	0,00E+00	5,25E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,34E+00	1,23E-03	0,00E+00	0,00E+00	0,00E+00	-1,01E-03
GWP- luluc	kg CO_2-eq.	1,08E-01	1,20E-03	5,47E-05	0,00E+00	1,11E+01	4,77E-04	0,00E+00	0,00E+00	0,00E+00	1,12E-01	8,83E-05	1,27E-04	2,86E-05	1,69E-06	-1,27E-04
ODP	kg CFC 11 -eq.	5,71E-07	4,45E-08	2,42E-09	0,00E+00	1,03E-06	4,49E-09	0,00E+00	0,00E+00	0,00E+00	1,81E-06	6,75E-10	6,03E-09	8,98E-10	5,81E-11	-8,81E-09
AP	mol H^+ eq.	2,53E+00	6,27E-03	5,38E-04	0,00E+00	1,42E-01	1,39E-02	0,00E+00	0,00E+00	0,00E+00	3,50E-01	2,03E-04	8,63E-04	2,16E-04	1,74E-05	-6,97E-04
EP-freshwater	kg P-eq.	2,00E-01	1,73E-04	1,27E-05	0,00E+00	5,92E-03	1,02E-03	0,00E+00	0,00E+00	0,00E+00	4,24E-02	3,35E-05	1,91E-05	5,30E-06	4,60E-07	-3,97E-05
EP- marine	kg N-eq.	1,39E-01	2,02E-03	4,29E-04	0,00E+00	1,13E-01	1,27E-03	0,00E+00	0,00E+00	0,00E+00	6,82E-02	3,28E-05	2,96E-04	8,83E-05	3,30E-05	-2,41E-04
EP-terrestrial	mol N-eq.	1,86E+00	2,13E-02	2,05E-03	0,00E+00	4,62E-01	1,22E-02	0,00E+00	0,00E+00	0,00E+00	6,54E-01	2,97E-04	3,12E-03	8,88E-04	6,72E-05	-2,39E-03
POCP	kg NMVOC-eq.	5,27E-01	9,06E-03	8,34E-04	0,00E+00	9,33E-02	3,62E-03	0,00E+00	0,00E+00	0,00E+00	2,39E-01	9,54E-05	1,29E-03	2,95E-04	2,75E-05	-9,66E-04
ADPE	kg Sb-eq.	3,48E-02	8,93E-06	4,53E-07	0,00E+00	1,76E-04	1,71E-04	0,00E+00	0,00E+00	0,00E+00	3,36E-04	4,29E-07	8,84E-07	1,48E-07	4,44E-09	-7,32E-07
ADPF	MJ	5,37E+02	2,88E+01	1,60E+00	0,00E+00	2,69E+02	8,05E+00	0,00E+00	0,00E+00	0,00E+00	1,15E+03	8,05E-01	3,90E+00	5,95E-01	5,20E-02	-3,95 E+00
WDP	m^3	4,13E+01	1,19E-01	1,45E-02	0,00E+00	6,47E+01	5,41E-01	0,00E+00	0,00E+00	0,00E+00	8,77E+03	9,07E-03	1,48E-02	8,76E-03	2,20E-03	-1,93E-02
Caption	GWP-total = Global Warming Potential - total; GWP-fossil = Global Warming Potential - fossil fuels; GWP-biogenic = Global Warming Potential - biogenic; GWP-luluc = Global Warming Potential - land use and land use change; ODP = Ozone Depletion; AP = Acidification; EP-freshwater = Eutrophication – aquatic freshwater; EP-marine = Eutrophication – aquatic marine; EP-terrestrial = Eutrophication – terrestrial; POCP = Photochemical zone formation; ADPm = Abiotic Depletion Potential – minerals and metals; ADPf = Abiotic Depletion Potential – fossil fuels; WDP = water use															
	The numbers are declared in scientific notation, fx 1,95E+02. This number can also be written as: 1,95*102 or 195, while 1,12 E-11 is the same as 1,12*10-11 or 0,0000000000112.															
Disclaimer	[1] The results of this environmental indicator shall be used with care as the uncertainties on these results are high or as there is limited experience with the indicator.															

Table 9: Additional environmental impact indicators - Group 1.

ADDITIONAL ENVIRONMENTAL IMPACTS PER FIXTURE																
Parameter	**Unit**	**A1-A3**	**A4**	**A5**	**B1**	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**C1**	**C2**	**C3**	**C4**	**D**
PM	Disease Incidence	6,24E-06	1,19E-07	1,06E-08	0,00E+00	2,02E-06	1,10E-07	0,00E+00	0,00E+00	0,00E+00	3,63E-06	7,44E-10	1,89E-08	3,84E-09	3,55E-10	-9,82 E-09
IRP	kBq U235 eq	2,39E+01	5,74E-02	4,03E-03	0,00E+00	1,26E+00	2,67E-02	0,00E+00	0,00E+00	0,00E+00	2,43E+01	2,27E-02	6,30E-03	1,46E-03	6,57E-05	-2,21 E-02
ETP-fw	CTUe	3,67E+03	1,52E+01	1,62E+00	0,00E+00	5,34E+02	1,88E+01	0,00E+00	0,00E+00	0,00E+00	2,93E+02	1,35E-01	1,97E+00	4,94E-01	6,47E-02	-7,66 E-01
HTP-c	CTUh	4,09E-07	1,05E-09	8,47E-11	0,00E+00	2,96E-08	2,05E-09	0,00E+00	0,00E+00	0,00E+00	2,82E-07	1,66E-11	1,16E-10	3,88E-11	1,83E-12	-9,96 E-11
HTP-nc	CTUh	3,36E-05	2,01E-08	1,99E-09	0,00E+00	6,85E-07	1,67E-07	0,00E+00	0,00E+00	0,00E+00	3,69E-06	6,63E-10	2,59E-09	8,07E-10	4,24E-11	-1,55 E-09
SQP	-	8,78E+02	1,20E+01	7,71E-01	0,00E+00	8,50E+02	4,62E+00	0,00E+00	0,00E+00	0,00E+00	2,50E+02	1,57E-01	2,00E+00	4,32E-01	1,09E-01	-7,61 E-01
Caption	PM = Particulate Matter emissions; IRP = Ionizing radiation – human health; ETP-fw = Eco toxicity – freshwater; HTP-c = Human toxicity – cancer effects; HTP-nc = Human toxicity – non cancer effects; SQP = Soil Quality (dimensionless)															
	The numbers are declared in scientific notation, fx 1,95E+02. This number can also be written as: 1,95*102 or 195, while 1,12 E-11 is the same as 1,12*10-11 or 0,0000000000112.															
Disclaimers	1 The results of this environmental indicator shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator.															
	2 This impact category deals mainly with the eventual impact of low dose ionizing radiation on human health of the nuclear fuel cycle. It does not consider effects due to possible nuclear accidents, occupational exposure nor due to radioactive waste disposal in underground facilities. Potential ionizing radiation from the soil, from radon and from some construction materials is also not measured by this indicator.															

Table 10: Parameters describing resource use - Group 1.

RESOURCE USE PER FIXTURE																
Parameter	**Unit**	**A1-A3**	**A4**	**A5**	**B1**	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**C1**	**C2**	**C3**	**C4**	**D**
PERE	MJ	2,32E+02	6,26E-01	-1,73E+01	0,00E+00	4,59E+02	6,79E-01	0,00E+00	0,00E+00	0,00E+00	1,69E+02	1,80E-01	6,80E-02	1,76E-02	8,51E-04	-1,87E-01
PERM	MJ	2,02E-01	0,00E+00	1,73E+01	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	0,00E+00
PERT	MJ	2,32E+02	6,26E-01	4,20E-02	0,00E+00	4,59E+02	6,79E-01	0,00E+00	0,00E+00	0,00E+00	1,69E+02	1,80E-01	6,80E-02	1,76E-02	8,51E-04	-1,87E-01
PENRE	MJ	5,68E+02	3,06E+01	1,23E+00	0,00E+00	3,04E+02	8,64E+00	0,00E+00	0,00E+00	0,00E+00	1,21E+03	8,44E-01	4,14E+00	6,34E-01	5,53E-02	-4,29E+00
PENRM	MJ	4,42E+00	0,00E+00	4,69E-01	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	0,00E+00
PENRT	MJ	5,72E+02	3,06E+01	1,70E+00	0,00E+00	3,04E+02	8,64E+00	0,00E+00	0,00E+00	0,00E+00	1,21E+03	8,44E-01	4,14E+00	6,34E-01	5,53E-02	-4,29E+00
SM	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	0,00E+00	0,00E+00	0,00E+00	0,00E+00
RSF	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	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
NRSF	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	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
FW	m^3	4,24E+01	1,18E-01	1,45E-02	0,00E+00	6,27E+01	5,31E-01	0,00E+00	0,00E+00	0,00E+00	8,36E+03	5,81E-06	1,54E-06	3,61E-07	1,58E-08	-5,62E-06
Caption	PERE = Use of renewable primary energy excluding renewable primary energy resources used as raw materials; PERM = Use of renewable primary energy resources used as raw materials; PERT = Total use of renewable primary energy resources; PENRE = Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials; PENRM = Use of non-renewable primary energy resources used as raw materials; PENRT = Total use of non-renewable primary energy resources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Net use of fresh water															
	The numbers are declared in scientific notation, fx 1,95E+02. This number can also be written as: 1,95*102 or 195, while 1,12E-11 is the same as 1,12*10-11 or 0,0000000000112.															

Table 11: End-of-life (waste categories and output flows) - Group 1.

WASTE CATEGORIES AND OUTPUT FLOWS PER FIXTURE																
Parameter	**Unit**	**A1-A3**	**A4**	**A5**	**B1**	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**C1**	**C2**	**C3**	**C4**	**D**
HWD	kg	1,85E-02	1,83E-04	9,88E-06	0,00E+00	1,15E-03	1,01E-04	0,00E+00	0,00E+00	0,00E+00	3,33E-03	1,41E-06	2,48E-05	3,31E-06	2,73E-07	-1,74E-05
NHWD	kg	1,60E+01	9,17E-01	1,86E-01	0,00E+00	3,64E+00	1,51E-01	0,00E+00	0,00E+00	0,00E+00	1,33E+01	3,24E-03	1,61E-01	3,42E-02	2,64E-01	-5,33E-02
RWD	kg	1,30E-03	1,42E-05	1,01E-06	0,00E+00	3,15E-04	6,87E-06	0,00E+00	0,00E+00	0,00E+00	6,22E-03	5,81E-06	1,54E-06	3,61E-07	1,58E-08	-5,62E-06
CRU	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	0,00E+00	0,00E+00	0,00E+00	0,00E+00
MFR	kg	3,28E+00	0,00E+00	8,16E-01	0,00E+00	0,00E+00	1,77E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	3,88E+00	0,00E+00	0,00E+00
MER	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	0,00E+00	0,00E+00	0,00E+00	0,00E+00
EEE	MJ	2,99E-03	0,00E+00	1,60E-01	0,00E+00	0,00E+00	1,45E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,08E-01	0,00E+00	0,00E+00
EET	MJ	2,87E-02	0,00E+00	1,54E+00	0,00E+00	0,00E+00	1,39E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,03E+00	0,00E+00	0,00E+00
Caption	HWD = Hazardous waste disposed; NHWD = Non-hazardous waste disposed; RWD = Radioactive waste disposed; CRU = Components for re-use; MFR = Materials for recycling; MER = Materials for energy recovery; EEE = Exported electrical energy; EET = Exported thermal energy															
	The numbers are declared in scientific notation, fx 1,95E+02. This number can also be written as: 1,95*102 or 195, while 1,12E-11 is the same as 1,12*10-11 or 0,0000000000112.															

Table 12: Biogenic carbon content - Group 1.

BIOGENIC CARBON CONTENT PER FIXTURE		
Parameter	**Unit**	**At the factory gate**
Biogenic carbon content in a product	kg C	0
Biogenic carbon content in accompanying packaging	kg C	0,54
Note	1 kg biogenic carbon is equivalent to 44/12 kg of CO_2	

Group 2: Natural brass is represented by 321-19 – Natural brass

Table 13: Environmental impact indicators - Group 2.

ENVIRONMENTAL IMPACTS PER FIXTURE																
Parameter	**Unit**	**A1-A3**	**A4**	**A5**	**B1**	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**C1**	**C2**	**C3**	**C4**	**D**
GWP- total	kg CO_2-eq.	5,32E+01	3,38E+00	6,62E-01	0,00E+00	8,93E+00	6,46E-01	0,00E+00	0,00E+00	0,00E+00	6,54E+01	3,67E-02	3,14E-01	2,36E-01	1,96E-02	-3,41E-01
GWP-fossil	kg CO_2-eq.	5,31E+01	3,38E+00	1,46E-01	0,00E+00	1,59E+01	6,18E-01	0,00E+00	0,00E+00	0,00E+00	6,39E+01	3,54E-02	3,14E-01	2,31E-01	7,98E-03	-3,21E-01
GWP-biogenic	kg CO_2-eq.	-3,89E-01	0,00E+00	4,95E-01	0,00E+00	5,25E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,34E+00	1,23E-03	0,00E+00	0,00E+00	0,00E+00	-1,25E-03
GWP- luluc	kg CO_2-eq.	1,31E-01	1,98E-03	5,71E-05	0,00E+00	1,11E+01	4,90E-04	0,00E+00	0,00E+00	0,00E+00	1,12E-01	8,83E-05	1,44E-04	3,19E-05	1,93E-06	-1,50E-04
ODP	kg CFC 11 -eq.	8,02E-07	7,34E-08	2,52E-09	0,00E+00	1,03E-06	4,95E-09	0,00E+00	0,00E+00	0,00E+00	1,81E-06	6,75E-10	6,84E-09	1,09E-09	6,73E-11	-1,07E-08
AP	mol H^{+-} eq.	3,22E+00	1,03E-02	5,61E-04	0,00E+00	1,42E-01	1,40E-02	0,00E+00	0,00E+00	0,00E+00	3,50E-01	2,03E-04	9,78E-04	2,52E-04	2,00E-05	-7,98E-04
EP-freshwater	kg P-eq.	2,54E-01	2,86E-04	1,32E-05	0,00E+00	5,92E-03	1,02E-03	0,00E+00	0,00E+00	0,00E+00	4,24E-02	3,35E-05	2,17E-05	5,91E-06	4,99E-07	-4,74E-05
EP- marine	kg N-eq.	1,76E-01	3,33E-03	4,47E-04	0,00E+00	1,13E-01	1,29E-03	0,00E+00	0,00E+00	0,00E+00	6,82E-02	3,28E-05	3,35E-04	1,03E-04	3,40E-05	-2,72E-04
EP-terrestrial	mol N-eq.	2,37E+00	3,51E-02	2,14E-03	0,00E+00	4,62E-01	1,24E-02	0,00E+00	0,00E+00	0,00E+00	6,54E-01	2,97E-04	3,53E-03	1,04E-03	7,78E-05	-2,70E-03
POCP	kg NMVOC-eq.	6,71E-01	1,49E-02	8,69E-04	0,00E+00	9,33E-02	3,71E-03	0,00E+00	0,00E+00	0,00E+00	2,39E-01	9,54E-05	1,47E-03	3,44E-04	3,11E-05	-1,10E-03
ADPE	kg Sb-eq.	4,42E-02	1,47E-05	4,72E-07	0,00E+00	1,76E-04	1,71E-04	0,00E+00	0,00E+00	0,00E+00	3,36E-04	4,29E-07	1,00E-06	1,66E-07	5,08E-09	-8,50E-07
ADPF	MJ	6,89E+02	4,75E+01	1,67E+00	0,00E+00	2,69E+02	8,34E+00	0,00E+00	0,00E+00	0,00E+00	1,15E+03	8,05E-01	4,42E+00	6,80E-01	6,02E-02	-4,73 E+00
WDP	m^3	5,30E+01	1,97E-01	1,52E-02	0,00E+00	6,47E+01	5,42E-01	0,00E+00	0,00E+00	0,00E+00	8,77E+03	9,07E-03	1,68E-02	9,97E-03	2,56E-03	-2,28E-02
Caption	GWP-total = Global Warming Potential - total; GWP-fossil = Global Warming Potential - fossil fuels; GWP-biogenic = Global Warming Potential - biogenic; GWP-luluc = Global Warming Potential - land use and land use change; ODP = Ozone Depletion; AP = Acidification; EP-freshwater = Eutrophication – aquatic freshwater; EP-marine = Eutrophication – aquatic marine; EP-terrestrial = Eutrophication – terrestrial; POCP = Photochemical zone formation; ADPm = Abiotic Depletion Potential – minerals and metals; ADPf = Abiotic Depletion Potential – fossil fuels; WDP = water use															
	The numbers are declared in scientific notation, fx 1,95E+02. This number can also be written as: 1,95*102 or 195, while 1,12E-11 is the same as 1,12*10-11 or 0,0000000000112.															
Disclaimer	1 The results of this environmental indicator shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator.															

Table 14: Additional environmental impacts - Group 2.

ADDITIONAL ENVIRONMENTAL IMPACTS PER FIXTURE																
Parameter	**Unit**	**A1-A3**	**A4**	**A5**	**B1**	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**C1**	**C2**	**C3**	**C4**	**D**
PM	Disease Incidence	7,90E-06	1,97E-07	1,10E-08	0,00E+00	2,02E-06	1,11E-07	0,00E+00	0,00E+00	0,00E+00	3,63E-06	7,44E-10	2,14E-08	4,39E-09	4,12E-10	-1,08 E-08
IRP	kBq U235 eq	2,51E+01	9,47E-02	4,20E-03	0,00E+00	1,26E+00	2,73E-02	0,00E+00	0,00E+00	0,00E+00	2,43E+01	2,27E-02	7,14E-03	1,62E-03	7,40E-05	-2,67 E-02
ETP-fw	CTUe	4,66E+03	2,51E+01	1,69E+00	0,00E+00	5,34E+02	1,89E+01	0,00E+00	0,00E+00	0,00E+00	2,93E+02	1,35E-01	2,24E+00	6,40E-01	7,00E-02	-8,62 E-01
HTP-c	CTUh	5,17E-07	1,73E-09	8,84E-11	0,00E+00	2,96E-08	2,06E-09	0,00E+00	0,00E+00	0,00E+00	2,82E-07	1,66E-11	1,32E-10	4,29E-11	2,02E-12	-1,12 E-10
HTP-nc	CTUh	4,28E-05	3,32E-08	2,07E-09	0,00E+00	6,85E-07	1,67E-07	0,00E+00	0,00E+00	0,00E+00	3,69E-06	6,63E-10	2,93E-09	9,05E-10	4,48E-11	-1,80 E-09
SQP	-	1,11E+03	1,98E+01	8,05E-01	0,00E+00	8,50E+02	4,74E+00	0,00E+00	0,00E+00	0,00E+00	2,50E+02	1,57E-01	2,27E+00	4,91E-01	1,26E-01	-8,61 E-01
Caption	PM = Particulate Matter emissions; IRP = Ionizing radiation – human health; ETP-fw = Eco toxicity – freshwater; HTP-c = Human toxicity – cancer effects; HTP-nc = Human toxicity – non cancer effects; SQP = Soil Quality (dimensionless)															
	The numbers are declared in scientific notation, fx 1,95E+02. This number can also be written as: 1,95*102 or 195, while 1,12E-11 is the same as 1,12*10-11 or 0,0000000000112.															
Disclaimers	1 The results of this environmental indicator shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator.															
	2 This impact category deals mainly with the eventual impact of low dose ionizing radiation on human health of the nuclear fuel cycle. It does not consider effects due to possible nuclear accidents, occupational exposure nor due to radioactive waste disposal in underground facilities. Potential ionizing radiation from the soil, from radon and from some construction materials is also not measured by this indicator.															

Table 15: Parameters describing resource use - Group 2.

RESOURCE USE PER FIXTURE																
Parameter	**Unit**	**A1-A3**	**A4**	**A5**	**B1**	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**C1**	**C2**	**C3**	**C4**	**D**
PERE	MJ	3,64E+02	1,03E+00	-1,80E+01	0,00E+00	4,59E+02	6,85E-01	0,00E+00	0,00E+00	0,00E+00	1,69E+02	1,80E-01	7,71E-02	1,96E-02	9,62E-04	-2,25E-01
PERM	MJ	2,02E-01	0,00E+00	1,81E+01	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	0,00E+00
PERT	MJ	3,65E+02	1,03E+00	4,38E-02	0,00E+00	4,59E+02	6,85E-01	0,00E+00	0,00E+00	0,00E+00	1,69E+02	1,80E-01	7,71E-02	1,96E-02	9,62E-04	-2,25E-01
PENRE	MJ	7,29E+02	5,04E+01	1,25E+00	0,00E+00	3,04E+02	8,95E+00	0,00E+00	0,00E+00	0,00E+00	1,21E+03	8,44E-01	4,69E+00	7,24E-01	6,41E-02	-5,14E+00
PENRM	MJ	5,99E+00	0,00E+00	5,26E-01	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	0,00E+00
PENRT	MJ	7,35E+02	5,04E+01	1,77E+00	0,00E+00	3,04E+02	8,95E+00	0,00E+00	0,00E+00	0,00E+00	1,21E+03	8,44E-01	4,69E+00	7,24E-01	6,41E-02	-5,14E+00
SM	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	0,00E+00	0,00E+00	0,00E+00	0,00E+00
RSF	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	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
NRSF	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	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
FW	m^3	5,43E+01	1,95E-01	1,52E-02	0,00E+00	6,27E+01	5,32E-01	0,00E+00	0,00E+00	0,00E+00	8,36E+03	5,81E-06	1,75E-06	4,02E-07	1,78E-08	-6,82E-06
Caption	PERE = Use of renewable primary energy excluding renewable primary energy resources used as raw materials; PERM = Use of renewable primary energy resources used as raw materials; PERT = Total use of renewable primary energy resources; PENRE = Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials; PENRM = Use of non-renewable primary energy resources used as raw materials; PENRT = Total use of non-renewable primary energy resources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Net use of fresh water															
	The numbers are declared in scientific notation, fx 1,95E+02. This number can also be written as: 1,95*102 or 195, while 1,12E-11 is the same as 1,12*10-11 or 0,0000000000112.															

Table 16: End-of-life (waste categories and output flows) - Group 2.

WASTE CATEGORIES AND OUTPUT FLOWS PER FIXTURE																
Parameter	**Unit**	**A1-A3**	**A4**	**A5**	**B1**	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**C1**	**C2**	**C3**	**C4**	**D**
HWD	kg	2,36E-02	3,01E-04	1,03E-05	0,00E+00	1,15E-03	1,03E-04	0,00E+00	0,00E+00	0,00E+00	3,33E-03	1,41E-06	2,81E-05	3,85E-06	3,15E-07	-2,06E-05
NHWD	kg	2,02E+01	1,51E+00	1,94E-01	0,00E+00	3,64E+00	1,60E-01	0,00E+00	0,00E+00	0,00E+00	1,33E+01	3,24E-03	1,82E-01	4,04E-02	3,05E-01	-5,97E-02
RWD	kg	1,63E-03	2,34E-05	1,05E-06	0,00E+00	3,15E-04	7,01E-06	0,00E+00	0,00E+00	0,00E+00	6,22E-03	5,81E-06	1,75E-06	4,02E-07	1,78E-08	-6,82E-06
CRU	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	0,00E+00	0,00E+00	0,00E+00	0,00E+00
MFR	kg	4,44E+00	0,00E+00	8,50E-01	0,00E+00	0,00E+00	1,77E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	4,39E+00	0,00E+00	0,00E+00
MER	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	0,00E+00	0,00E+00	0,00E+00	0,00E+00
EEE	MJ	2,99E-03	0,00E+00	1,68E-01	0,00E+00	0,00E+00	1,45E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,68E-01	0,00E+00	0,00E+00
EET	MJ	2,87E-02	0,00E+00	1,61E+00	0,00E+00	0,00E+00	1,39E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,61E+00	0,00E+00	0,00E+00
Caption	HWD = Hazardous waste disposed; NHWD = Non-hazardous waste disposed; RWD = Radioactive waste disposed; CRU = Components for re-use; MFR = Materials for recycling; MER = Materials for energy recovery; EEE = Exported electrical energy; EET = Exported thermal energy															
	The numbers are declared in scientific notation, fx 1,95E+02. This number can also be written as: 1,95*102 or 195, while 1,12E-11 is the same as 1,12*10-11 or 0,0000000000112.															

Table 17: Biogenic carbon content - Group 2.

BIOGENIC CARBON CONTENT PER FIXTURE		
Parameter	**Unit**	**At the factory gate**
Biogenic carbon content in a product	kg C	0
Biogenic carbon content in accompanying packaging	kg C	0,56
Note	1 kg biogenic carbon is equivalent to 44/12 kg of CO_2	

Group 3: Stainless steel is represented by 321L-40

Table 18: Environmental impact indicators - Group 3.

ENVIRONMENTAL IMPACTS PER FIXTURE																
Parameter	**Unit**	**A1-A3**	**A4**	**A5**	**B1**	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**C1**	**C2**	**C3**	**C4**	**D**
GWP- total	kg CO_2-eq.	3,97E+01	2,09E+00	6,35E-01	0,00E+00	8,93E+00	6,25E-01	0,00E+00	0,00E+00	0,00E+00	6,54E+01	3,67E-02	2,83E-01	1,61E-01	1,91E-02	-2,90E-01
GWP-fossil	kg CO_2-eq.	3,96E+01	2,08E+00	1,39E-01	0,00E+00	1,59E+01	5,97E-01	0,00E+00	0,00E+00	0,00E+00	6,39E+01	3,54E-02	2,82E-01	1,56E-01	7,54E-03	-2,72E-01
GWP-biogenic	kg CO_2-eq.	-3,58E-01	0,00E+00	4,76E-01	0,00E+00	5,25E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,34E+00	1,23E-03	0,00E+00	0,00E+00	0,00E+00	-1,01E-03
GWP- luluc	kg CO_2-eq.	9,46E-02	1,22E-03	5,47E-05	0,00E+00	1,11E+01	4,77E-04	0,00E+00	0,00E+00	0,00E+00	1,12E-01	8,83E-05	1,29E-04	2,90E-05	1,68E-06	-1,27E-04
ODP	kg CFC 11 -eq.	5,44E-07	4,53E-08	2,42E-09	0,00E+00	1,03E-06	4,49E-09	0,00E+00	0,00E+00	0,00E+00	1,81E-06	6,75E-10	6,15E-09	9,14E-10	5,79E-11	-8,83E-09
AP	mol H^{+} eq.	1,90E+00	6,38E-03	5,38E-04	0,00E+00	1,42E-01	1,39E-02	0,00E+00	0,00E+00	0,00E+00	3,50E-01	2,03E-04	8,79E-04	2,20E-04	1,73E-05	-7,01E-04
EP-freshwater	kg P-eq.	1,49E-01	1,76E-04	1,27E-05	0,00E+00	5,92E-03	1,02E-03	0,00E+00	0,00E+00	0,00E+00	4,24E-02	3,35E-05	1,95E-05	5,36E-06	4,59E-07	-3,98E-05
EP- marine	kg N-eq.	1,11E-01	2,05E-03	4,29E-04	0,00E+00	1,13E-01	1,27E-03	0,00E+00	0,00E+00	0,00E+00	6,82E-02	3,28E-05	3,01E-04	8,98E-05	3,30E-05	-2,43E-04
EP-terrestrial	mol N-eq.	1,46E+00	2,16E-02	2,05E-03	0,00E+00	4,62E-01	1,22E-02	0,00E+00	0,00E+00	0,00E+00	6,54E-01	2,97E-04	3,18E-03	9,03E-04	6,69E-05	-2,40E-03
POCP	kg NMVOC-eq.	4,19E-01	9,22E-03	8,34E-04	0,00E+00	9,33E-02	3,62E-03	0,00E+00	0,00E+00	0,00E+00	2,39E-01	9,54E-05	1,32E-03	3,00E-04	2,74E-05	-9,71E-04
ADPE	kg Sb-eq.	2,57E-02	9,08E-06	4,53E-07	0,00E+00	1,76E-04	1,71E-04	0,00E+00	0,00E+00	0,00E+00	3,36E-04	4,29E-07	9,00E-07	1,50E-07	4,43E-09	-7,34E-07
ADPF	MJ	5,04E+02	2,93E+01	1,60E+00	0,00E+00	2,69E+02	8,05E+00	0,00E+00	0,00E+00	0,00E+00	1,15E+03	8,05E-01	3,97E+00	6,06E-01	5,18E-02	-3,96 E+00
WDP	m^3	3,24E+01	1,21E-01	1,45E-02	0,00E+00	6,47E+01	5,41E-01	0,00E+00	0,00E+00	0,00E+00	8,77E+03	9,07E-03	1,51E-02	8,81E-03	2,20E-03	-1,94E-02
Caption	GWP-total = Global Warming Potential - total; GWP-fossil = Global Warming Potential - fossil fuels; GWP-biogenic = Global Warming Potential - biogenic; GWP-luluc = Global Warming Potential - land use and land use change; ODP = Ozone Depletion; AP = Acidification; EP-freshwater = Eutrophication – aquatic freshwater; EP-marine = Eutrophication – aquatic marine; EP-terrestrial = Eutrophication – terrestrial; POCP = Photochemical zone formation; ADPm = Abiotic Depletion Potential – minerals and metals; ADPf = Abiotic Depletion Potential – fossil fuels; WDP = water use															
	The numbers are declared in scientific notation, fx 1,95E+02. This number can also be written as: 1,95*102 or 195, while 1,12 E-11 is the same as 1,12*10-11 or 0,0000000000112.															
Disclaimer	1 The results of this environmental indicator shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator.															

Table 19: Additional environmental impacts - Group 3.

ADDITIONAL ENVIRONMENTAL IMPACTS PER FIXTURE																
Parameter	**Unit**	**A1-A3**	**A4**	**A5**	**B1**	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**C1**	**C2**	**C3**	**C4**	**D**
PM	Disease Incidence	5,29E-06	1,21E-07	1,06E-08	0,00E+00	2,02E-06	1,10E-07	0,00E+00	0,00E+00	0,00E+00	3,63E-06	7,44E-10	1,93E-08	3,91E-09	3,54E-10	-9,88 E-09
IRP	kBq U235 eq	2,34E+01	5,84E-02	4,03E-03	0,00E+00	1,26E+00	2,67E-02	0,00E+00	0,00E+00	0,00E+00	2,43E+01	2,27E-02	6,42E-03	1,47E-03	6,55E-05	-2,21 E-02
ETP-fw	CTUe	2,72E+03	1,55E+01	1,62E+00	0,00E+00	5,34E+02	1,88E+01	0,00E+00	0,00E+00	0,00E+00	2,93E+02	1,35E-01	2,01E+00	4,99E-01	6,47E-02	-7,71 E-01
HTP-c	CTUh	3,51E-07	1,07E-09	8,47E-11	0,00E+00	2,96E-08	2,05E-09	0,00E+00	0,00E+00	0,00E+00	2,82E-07	1,66E-11	1,18E-10	3,93E-11	1,83E-12	-1,00 E-10
HTP-nc	CTUh	2,48E-05	2,04E-08	1,99E-09	0,00E+00	6,85E-07	1,67E-07	0,00E+00	0,00E+00	0,00E+00	3,69E-06	6,63E-10	2,64E-09	8,15E-10	4,24E-11	-1,56 E-09
SQP	-	7,01E+02	1,22E+01	7,71E-01	0,00E+00	8,50E+02	4,62E+00	0,00E+00	0,00E+00	0,00E+00	2,50E+02	1,57E-01	2,04E+00	4,40E-01	1,08E-01	-7,69 E-01
Caption	PM = Particulate Matter emissions; IRP = Ionizing radiation – human health; ETP-fw = Eco toxicity – freshwater; HTP-c = Human toxicity – cancer effects; HTP-nc = Human toxicity – non cancer effects; SQP = Soil Quality (dimensionless)															
	The numbers are declared in scientific notation, fx 1,95E+02. This number can also be written as: 1,95*102 or 195, while 1,12 E-11 is the same as 1,12*10-11 or 0,0000000000112.															
Disclaimers	1 The results of this environmental indicator shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator.															
	2 This impact category deals mainly with the eventual impact of low dose ionizing radiation on human health of the nuclear fuel cycle. It does not consider effects due to possible nuclear accidents, occupational exposure nor due to radioactive waste disposal in underground facilities. Potential ionizing radiation from the soil, from radon and from some construction materials is also not measured by this indicator.															

Table 20: Parameters describing resource use - Group 3.

RESOURCE USE PER FIXTURE																
Parameter	**Unit**	**A1-A3**	**A4**	**A5**	**B1**	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**C1**	**C2**	**C3**	**C4**	**D**
PERE	MJ	2,46E+02	6,37E-01	-1,73E+01	0,00E+00	4,59E+02	6,79E-01	0,00E+00	0,00E+00	0,00E+00	1,69E+02	1,80E-01	6,93E-02	1,78E-02	8,49E-04	-1,87E-01
PERM	MJ	2,02E-01	0,00E+00	1,73E+01	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	0,00E+00
PERT	MJ	2,47E+02	6,37E-01	4,20E-02	0,00E+00	4,59E+02	6,79E-01	0,00E+00	0,00E+00	0,00E+00	1,69E+02	1,80E-01	6,93E-02	1,78E-02	8,49E-04	-1,87E-01
PENRE	MJ	5,33E+02	3,11E+01	1,23E+00	0,00E+00	3,04E+02	8,64E+00	0,00E+00	0,00E+00	0,00E+00	1,21E+03	8,44E-01	4,22E+00	6,45E-01	5,51E-02	-4,30E+00
PENRM	MJ	4,42E+00	0,00E+00	4,69E-01	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	0,00E+00
PENRT	MJ	5,37E+02	3,11E+01	1,70E+00	0,00E+00	3,04E+02	8,64E+00	0,00E+00	0,00E+00	0,00E+00	1,21E+03	8,44E-01	4,22E+00	6,45E-01	5,51E-02	-4,30E+00
SM	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	0,00E+00	0,00E+00	0,00E+00	0,00E+00
RSF	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	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
NRSF	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	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
FW	m^3	3,38E+01	1,20E-01	1,45E-02	0,00E+00	6,27E+01	5,31E-01	0,00E+00	0,00E+00	0,00E+00	8,36E+03	5,81E-06	1,57E-06	3,65E-07	1,57E-08	-5,63E-06
Caption	PERE = Use of renewable primary energy excluding renewable primary energy resources used as raw materials; PERM = Use of renewable primary energy resources used as raw materials; PERT = Total use of renewable primary energy resources; PENRE = Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials; PENRM = Use of non-renewable primary energy resources used as raw materials; PENRT = Total use of non-renewable primary energy resources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Net use of fresh water															
	The numbers are declared in scientific notation, fx 1,95E+02. This number can also be written as: 1,95*102 or 195, while 1,12E-11 is the same as 1,12*10-11 or 0,0000000000112.															

Table 21: End-of-life (waste categories and output flows) - Group 3.

WASTE CATEGORIES AND OUTPUT FLOWS PER FIXTURE																
Parameter	**Unit**	**A1-A3**	**A4**	**A5**	**B1**	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**C1**	**C2**	**C3**	**C4**	**D**
HWD	kg	1,38E-02	1,86E-04	9,88E-06	0,00E+00	1,15E-03	1,01E-04	0,00E+00	0,00E+00	0,00E+00	3,33E-03	1,41E-06	2,52E-05	3,37E-06	2,72E-07	-1,75E-05
NHWD	kg	2,05E+01	9,33E-01	1,86E-01	0,00E+00	3,64E+00	1,51E-01	0,00E+00	0,00E+00	0,00E+00	1,33E+01	3,24E-03	1,64E-01	3,49E-02	2,62E-01	-5,39E-02
RWD	kg	1,17E-03	1,44E-05	1,01E-06	0,00E+00	3,15E-04	6,87E-06	0,00E+00	0,00E+00	0,00E+00	6,22E-03	5,81E-06	1,57E-06	3,65E-07	1,57E-08	-5,63E-06
CRU	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	0,00E+00	0,00E+00	0,00E+00	0,00E+00
MFR	kg	3,16E+00	0,00E+00	8,16E-01	0,00E+00	0,00E+00	1,77E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	3,95E+00	0,00E+00	0,00E+00
MER	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	0,00E+00	0,00E+00	0,00E+00	0,00E+00
EEE	MJ	2,99E-03	0,00E+00	1,60E-01	0,00E+00	0,00E+00	1,45E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,08E-01	0,00E+00	0,00E+00
EET	MJ	2,87E-02	0,00E+00	1,54E+00	0,00E+00	0,00E+00	1,39E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,03E+00	0,00E+00	0,00E+00
Caption	HWD = Hazardous waste disposed; NHWD = Non-hazardous waste disposed; RWD = Radioactive waste disposed; CRU = Components for re-use; MFR = Materials for recycling; MER = Materials for energy recovery; EEE = Exported electrical energy; EET = Exported thermal energy															
	The numbers are declared in scientific notation, fx 1,95E+02. This number can also be written as: 1,95*102 or 195, while 1,12E-11 is the same as 1,12*10-11 or 0,0000000000112.															

Table 22: Biogenic carbon content - Group 3.

BIOGENIC CARBON CONTENT PER FIXTURE		
Parameter	**Unit**	**At the factory gate**
Biogenic carbon content in a product	kg C	0
Biogenic carbon content in accompanying packaging	kg C	0,54
Note	1 kg biogenic carbon is equivalent to 44/12 kg of CO_2	

Group 4: Colors is represented by 321-27 – Matt black

Table 23: Environmental impact indicators - Group 4.

ENVIRONMENTAL IMPACTS PER FIXTURE																
Parameter	**Unit**	**A1-A3**	**A4**	**A5**	**B1**	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**C1**	**C2**	**C3**	**C4**	**D**
GWP- total	kg CO_2-eq.	5,26E+01	3,42E+00	6,62E-01	0,00E+00	8,93E+00	6,46E-01	0,00E+00	0,00E+00	0,00E+00	6,54E+01	3,67E-02	3,18E-01	2,36E-01	1,98E-02	-3,41E-01
GWP-fossil	kg CO_2-eq.	5,25E+01	3,42E+00	1,46E-01	0,00E+00	1,59E+01	6,18E-01	0,00E+00	0,00E+00	0,00E+00	6,39E+01	3,54E-02	3,18E-01	2,31E-01	8,24E-03	-3,21E-01
GWP-biogenic	kg CO_2-eq.	-3,90E-01	0,00E+00	4,95E-01	0,00E+00	5,25E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,34E+00	1,23E-03	0,00E+00	0,00E+00	0,00E+00	-1,25E-03
GWP- luluc	kg CO_2-eq.	1,30E-01	2,00E-03	5,71E-05	0,00E+00	1,11E+01	4,90E-04	0,00E+00	0,00E+00	0,00E+00	1,12E-01	8,83E-05	1,45E-04	3,21E-05	1,95E-06	-1,51E-04
ODP	kg CFC 11 -eq.	7,77E-07	7,43E-08	2,52E-09	0,00E+00	1,03E-06	4,95E-09	0,00E+00	0,00E+00	0,00E+00	1,81E-06	6,75E-10	6,92E-09	1,09E-09	6,81E-11	-1,07E-08
AP	mol H^{+} eq.	3,17E+00	1,05E-02	5,61E-04	0,00E+00	1,42E-01	1,40E-02	0,00E+00	0,00E+00	0,00E+00	3,50E-01	2,03E-04	9,89E-04	2,53E-04	2,02E-05	-7,99E-04
EP-freshwater	kg P-eq.	2,51E-01	2,89E-04	1,32E-05	0,00E+00	5,92E-03	1,02E-03	0,00E+00	0,00E+00	0,00E+00	4,24E-02	3,35E-05	2,19E-05	5,96E-06	5,03E-07	-4,74E-05
EP- marine	kg N-eq.	1,74E-01	3,37E-03	4,47E-04	0,00E+00	1,13E-01	1,29E-03	0,00E+00	0,00E+00	0,00E+00	6,82E-02	3,28E-05	3,39E-04	1,03E-04	3,41E-05	-2,72E-04
EP-terrestrial	mol N-eq.	2,34E+00	3,55E-02	2,14E-03	0,00E+00	4,62E-01	1,24E-02	0,00E+00	0,00E+00	0,00E+00	6,54E-01	2,97E-04	3,58E-03	1,04E-03	7,86E-05	-2,70E-03
POCP	kg NMVOC-eq.	6,62E-01	1,51E-02	8,69E-04	0,00E+00	9,33E-02	3,71E-03	0,00E+00	0,00E+00	0,00E+00	2,39E-01	9,54E-05	1,48E-03	3,45E-04	3,15E-05	-1,10E-03
ADPE	kg Sb-eq.	4,35E-02	1,49E-05	4,72E-07	0,00E+00	1,76E-04	1,71E-04	0,00E+00	0,00E+00	0,00E+00	3,36E-04	4,29E-07	1,01E-06	1,67E-07	5,15E-09	-8,50E-07
ADPF	MJ	6,81E+02	4,80E+01	1,67E+00	0,00E+00	2,69E+02	8,34E+00	0,00E+00	0,00E+00	0,00E+00	1,15E+03	8,05E-01	4,47E+00	6,82E-01	6,09E-02	-4,73 E+00
WDP	m^3	5,24E+01	1,99E-01	1,52E-02	0,00E+00	6,47E+01	5,42E-01	0,00E+00	0,00E+00	0,00E+00	8,77E+03	9,07E-03	1,69E-02	9,99E-03	2,59E-03	-2,28E-02
Caption	GWP-total = Global Warming Potential - total; GWP-fossil = Global Warming Potential - fossil fuels; GWP-biogenic = Global Warming Potential - biogenic; GWP-luluc = Global Warming Potential - land use and land use change; ODP = Ozone Depletion; AP = Acidification; EP-freshwater = Eutrophication – aquatic freshwater; EP-marine = Eutrophication – aquatic marine; EP-terrestrial = Eutrophication – terrestrial; POCP = Photochemical zone formation; ADPm = Abiotic Depletion Potential – minerals and metals; ADPf = Abiotic Depletion Potential – fossil fuels; WDP = water use															
	The numbers are declared in scientific notation, fx 1,95E+02. This number can also be written as: 1,95*102 or 195, while 1,12E-11 is the same as 1,12*10-11 or 0,0000000000112.															
Disclaimer	1 The results of this environmental indicator shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator.															

Table 24: Additional environmental impacts - Group 4

ADDITIONAL ENVIRONMENTAL IMPACTS PER FIXTURE																
Parameter	**Unit**	**A1-A3**	**A4**	**A5**	**B1**	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**C1**	**C2**	**C3**	**C4**	**D**
PM	Disease Incidence	7,83E-06	1,99E-07	1,10E-08	0,00E+00	2,02E-06	1,11E-07	0,00E+00	0,00E+00	0,00E+00	3,63E-06	7,44E-10	2,17E-08	4,41E-09	4,17E-10	-1,08 E-08
IRP	kBq U235 eq	2,52E+01	9,58E-02	4,20E-03	0,00E+00	1,26E+00	2,73E-02	0,00E+00	0,00E+00	0,00E+00	2,43E+01	2,27E-02	7,22E-03	1,64E-03	7,50E-05	-2,67 E-02
ETP-fw	CTUe	4,59E+03	2,54E+01	1,69E+00	0,00E+00	5,34E+02	1,89E+01	0,00E+00	0,00E+00	0,00E+00	2,93E+02	1,35E-01	2,26E+00	6,41E-01	7,03E-02	-8,63 E-01
HTP-c	CTUh	5,11E-07	1,75E-09	8,84E-11	0,00E+00	2,96E-08	2,06E-09	0,00E+00	0,00E+00	0,00E+00	2,82E-07	1,66E-11	1,33E-10	4,30E-11	2,06E-12	-1,12 E-10
HTP-nc	CTUh	4,21E-05	3,35E-08	2,07E-09	0,00E+00	6,85E-07	1,67E-07	0,00E+00	0,00E+00	0,00E+00	3,69E-06	6,63E-10	2,97E-09	9,06E-10	4,54E-11	-1,80 E-09
SQP	-	1,10E+03	2,00E+01	8,05E-01	0,00E+00	8,50E+02	4,74E+00	0,00E+00	0,00E+00	0,00E+00	2,50E+02	1,57E-01	2,29E+00	4,93E-01	1,28E-01	-8,63 E-01
Caption	PM = Particulate Matter emissions; IRP = Ionizing radiation – human health; ETP-fw = Eco toxicity – freshwater; HTP-c = Human toxicity – cancer effects; HTP-nc = Human toxicity – non cancer effects; SQP = Soil Quality (dimensionless)															
	The numbers are declared in scientific notation, fx 1,95E+02. This number can also be written as: 1,95*102 or 195, while 1,12 E-11 is the same as 1,12*10-11 or 0,0000000000112.															
Disclaimers	1 The results of this environmental indicator shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator.															
	2 This impact category deals mainly with the eventual impact of low dose ionizing radiation on human health of the nuclear fuel cycle. It does not consider effects due to possible nuclear accidents, occupational exposure nor due to radioactive waste disposal in underground facilities. Potential ionizing radiation from the soil, from radon and from some construction materials is also not measured by this indicator.															

Table 25: Parameters describing resource use - Group 4

RESOURCE USE PER FIXTURE																
Parameter	**Unit**	**A1-A3**	**A4**	**A5**	**B1**	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**C1**	**C2**	**C3**	**C4**	**D**
PERE	MJ	3,08E+02	1,05E+00	-1,80E+01	0,00E+00	4,59E+02	6,85E-01	0,00E+00	0,00E+00	0,00E+00	1,69E+02	1,80E-01	7,80E-02	1,97E-02	9,73E-04	-2,25E-01
PERM	MJ	2,02E-01	0,00E+00	1,81E+01	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	0,00E+00
PERT	MJ	3,08E+02	1,05E+00	4,38E-02	0,00E+00	4,59E+02	6,85E-01	0,00E+00	0,00E+00	0,00E+00	1,69E+02	1,80E-01	7,80E-02	1,97E-02	9,73E-04	-2,25E-01
PENRE	MJ	7,20E+02	5,10E+01	1,25E+00	0,00E+00	3,04E+02	8,95E+00	0,00E+00	0,00E+00	0,00E+00	1,21E+03	8,44E-01	4,75E+00	7,26E-01	6,48E-02	-5,14E+00
PENRM	MJ	5,99E+00	0,00E+00	5,26E-01	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	0,00E+00
PENRT	MJ	7,26E+02	5,10E+01	1,77E+00	0,00E+00	3,04E+02	8,95E+00	0,00E+00	0,00E+00	0,00E+00	1,21E+03	8,44E-01	4,75E+00	7,26E-01	6,48E-02	-5,14E+00
SM	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	0,00E+00	0,00E+00	0,00E+00	0,00E+00
RSF	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	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
NRSF	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	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
FW	m^3	5,38E+01	1,97E-01	1,52E-02	0,00E+00	6,27E+01	5,32E-01	0,00E+00	0,00E+00	0,00E+00	8,36E+03	5,81E-06	1,77E-06	4,06E-07	1,80E-08	-6,82E-06
Caption	PERE = Use of renewable primary energy excluding renewable primary energy resources used as raw materials; PERM = Use of renewable primary energy resources used as raw materials; PERT = Total use of renewable primary energy resources; PENRE = Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials; PENRM = Use of non-renewable primary energy resources used as raw materials; PENRT = Total use of non-renewable primary energy resources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Net use of fresh water															
	The numbers are declared in scientific notation, fx 1,95E+02. This number can also be written as: 1,95*102 or 195, while 1,12E-11 is the same as 1,12*10-11 or 0,0000000000112.															

Table 26: End-of-life (waste categories and output flows) - Group 4

WASTE CATEGORIES AND OUTPUT FLOWS PER FIXTURE																
Parameter	**Unit**	**A1-A3**	**A4**	**A5**	**B1**	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**C1**	**C2**	**C3**	**C4**	**D**
HWD	kg	2,32E-02	3,05E-04	1,03E-05	0,00E+00	1,15E-03	1,03E-04	0,00E+00	0,00E+00	0,00E+00	3,33E-03	1,41E-06	2,84E-05	3,86E-06	3,18E-07	-2,06E-05
NHWD	kg	2,05E+01	1,53E+00	1,94E-01	0,00E+00	3,64E+00	1,60E-01	0,00E+00	0,00E+00	0,00E+00	1,33E+01	3,24E-03	1,84E-01	4,04E-02	3,08E-01	-5,97E-02
RWD	kg	1,63E-03	2,36E-05	1,05E-06	0,00E+00	3,15E-04	7,01E-06	0,00E+00	0,00E+00	0,00E+00	6,22E-03	5,81E-06	1,77E-06	4,06E-07	1,80E-08	-6,82E-06
CRU	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	0,00E+00	0,00E+00	0,00E+00	0,00E+00
MFR	kg	4,41E+00	0,00E+00	8,50E-01	0,00E+00	0,00E+00	1,77E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	4,44E+00	0,00E+00	0,00E+00
MER	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	0,00E+00	0,00E+00	0,00E+00	0,00E+00
EEE	MJ	2,99E-03	0,00E+00	1,68E-01	0,00E+00	0,00E+00	1,45E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,68E-01	0,00E+00	0,00E+00
EET	MJ	2,87E-02	0,00E+00	1,61E+00	0,00E+00	0,00E+00	1,39E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,61E+00	0,00E+00	0,00E+00
Caption	HWD = Hazardous waste disposed; NHWD = Non-hazardous waste disposed; RWD = Radioactive waste disposed; CRU = Components for re-use; MFR = Materials for recycling; MER = Materials for energy recovery; EEE = Exported electrical energy; EET = Exported thermal energy															
	The numbers are declared in scientific notation, fx 1,95E+02. This number can also be written as: 1,95*102 or 195, while 1,12E-11 is the same as 1,12*10-11 or 0,0000000000112.															

Table 27: Biogenic carbon content - Group 4

BIOGENIC CARBON CONTENT PER FIXTURE		
Parameter	**Unit**	**At the factory gate**
Biogenic carbon content in a product	kg C	0
Biogenic carbon content in accompanying packaging	kg C	0,56
Note	1 kg biogenic carbon is equivalent to 44/12 kg of CO_2	

Group 5: Exclusive color (PVD on Brass) is represented by 321L-60 – Black

Table 28: Environmental impact indicators - Group 5.

ENVIRONMENTAL IMPACTS PER FIXTURE																
Parameter	**Unit**	**A1-A3**	**A4**	**A5**	**B1**	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**C1**	**C2**	**C3**	**C4**	**D**
GWP- total	kg CO_2-eq.	5,31E+01	2,40E+00	6,62E-01	0,00E+00	8,93E+00	6,25E-01	0,00E+00	0,00E+00	0,00E+00	6,54E+01	3,67E-02	3,24E-01	2,37E-01	2,00E-02	-3,41E-01
GWP-fossil	kg CO_2-eq.	5,30E+01	2,40E+00	1,46E-01	0,00E+00	1,59E+01	5,97E-01	0,00E+00	0,00E+00	0,00E+00	6,39E+01	3,54E-02	3,23E-01	2,32E-01	8,45E-03	-3,22E-01
GWP-biogenic	kg CO_2-eq.	-3,90E-01	0,00E+00	4,95E-01	0,00E+00	5,25E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,34E+00	1,23E-03	0,00E+00	0,00E+00	0,00E+00	-1,25E-03
GWP- luluc	kg CO_2-eq.	1,32E-01	1,40E-03	5,71E-05	0,00E+00	1,11E+01	4,77E-04	0,00E+00	0,00E+00	0,00E+00	1,12E-01	8,83E-05	1,48E-04	3,24E-05	1,99E-06	-1,51E-04
ODP	kg CFC 11 -eq.	7,83E-07	5,21E-08	2,53E-09	0,00E+00	1,03E-06	4,49E-09	0,00E+00	0,00E+00	0,00E+00	1,81E-06	6,75E-10	7,04E-09	1,10E-09	6,97E-11	-1,07E-08
AP	mol H^+ eq.	3,23E+00	7,34E-03	5,61E-04	0,00E+00	1,42E-01	1,39E-02	0,00E+00	0,00E+00	0,00E+00	3,50E-01	2,03E-04	1,01E-03	2,55E-04	2,06E-05	-8,02E-04
EP-freshwater	kg P-eq.	2,55E-01	2,03E-04	1,32E-05	0,00E+00	5,92E-03	1,02E-03	0,00E+00	0,00E+00	0,00E+00	4,24E-02	3,35E-05	2,23E-05	6,02E-06	5,09E-07	-4,75E-05
EP- marine	kg N-eq.	1,77E-01	2,36E-03	4,47E-04	0,00E+00	1,13E-01	1,27E-03	0,00E+00	0,00E+00	0,00E+00	6,82E-02	3,28E-05	3,45E-04	1,04E-04	3,43E-05	-2,73E-04
EP-terrestrial	mol N-eq.	2,38E+00	2,49E-02	2,14E-03	0,00E+00	4,62E-01	1,22E-02	0,00E+00	0,00E+00	0,00E+00	6,54E-01	2,97E-04	3,64E-03	1,06E-03	8,04E-05	-2,71E-03
POCP	kg NMVOC-eq.	6,74E-01	1,06E-02	8,70E-04	0,00E+00	9,33E-02	3,62E-03	0,00E+00	0,00E+00	0,00E+00	2,39E-01	9,54E-05	1,51E-03	3,48E-04	3,21E-05	-1,11E-03
ADPE	kg Sb-eq.	4,44E-02	1,05E-05	4,72E-07	0,00E+00	1,76E-04	1,71E-04	0,00E+00	0,00E+00	0,00E+00	3,36E-04	4,29E-07	1,03E-06	1,69E-07	5,24E-09	-8,52E-07
ADPF	MJ	6,87E+02	3,37E+01	1,67E+00	0,00E+00	2,69E+02	8,05E+00	0,00E+00	0,00E+00	0,00E+00	1,15E+03	8,05E-01	4,55E+00	6,90E-01	6,23E-02	-4,74E+00
WDP	m^3	5,33E+01	1,39E-01	1,52E-02	0,00E+00	6,47E+01	5,41E-01	0,00E+00	0,00E+00	0,00E+00	8,77E+03	9,07E-03	1,72E-02	1,00E-02	2,65E-03	-2,29E-02
Caption	GWP-total = Global Warming Potential - total; GWP-fossil = Global Warming Potential - fossil fuels; GWP-biogenic = Global Warming Potential - biogenic; GWP-luluc = Global Warming Potential - land use and land use change; ODP = Ozone Depletion; AP = Acidification; EP-freshwater = Eutrophication – aquatic freshwater; EP-marine = Eutrophication – aquatic marine; EP-terrestrial = Eutrophication – terrestrial; POCP = Photochemical zone formation; ADPm = Abiotic Depletion Potential – minerals and metals; ADPf = Abiotic Depletion Potential – fossil fuels; WDP = water use															
	The numbers are declared in scientific notation, fx 1,95E+02. This number can also be written as: 1,95*102 or 195, while 1,12E-11 is the same as 1,12*10-11 or 0,0000000000112.															
Disclaimer	1 The results of this environmental indicator shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator.															

Table 29: Additional environmental impacts - Group 5.

ADDITIONAL ENVIRONMENTAL IMPACTS PER FIXTURE																
Parameter	**Unit**	**A1-A3**	**A4**	**A5**	**B1**	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**C1**	**C2**	**C3**	**C4**	**D**
PM	Disease Incidence	7,95E-06	1,40E-07	1,10E-08	0,00E+00	2,02E-06	1,10E-07	0,00E+00	0,00E+00	0,00E+00	3,63E-06	7,44E-10	2,21E-08	4,46E-09	4,26E-10	-1,09E-08
IRP	kBq U235 eq	2,52E+01	6,72E-02	4,20E-03	0,00E+00	1,26E+00	2,67E-02	0,00E+00	0,00E+00	0,00E+00	2,43E+01	2,27E-02	7,35E-03	1,65E-03	7,62E-05	-2,68E-02
ETP-fw	CTUe	4,69E+03	1,78E+01	1,69E+00	0,00E+00	5,34E+02	1,88E+01	0,00E+00	0,00E+00	0,00E+00	2,93E+02	1,35E-01	2,30E+00	6,44E-01	7,10E-02	-8,67E-01
HTP-c	CTUh	5,22E-07	1,23E-09	8,84E-11	0,00E+00	2,96E-08	2,05E-09	0,00E+00	0,00E+00	0,00E+00	2,82E-07	1,66E-11	1,35E-10	4,33E-11	2,09E-12	-1,13E-10
HTP-nc	CTUh	4,30E-05	2,35E-08	2,07E-09	0,00E+00	6,85E-07	1,67E-07	0,00E+00	0,00E+00	0,00E+00	3,69E-06	6,63E-10	3,02E-09	9,12E-10	4,59E-11	-1,80E-09
SQP	-	1,12E+03	1,40E+01	8,05E-01	0,00E+00	8,50E+02	4,62E+00	0,00E+00	0,00E+00	0,00E+00	2,50E+02	1,57E-01	2,33E+00	4,98E-01	1,31E-01	-8,68E-01
Caption	PM = Particulate Matter emissions; IRP = Ionizing radiation – human health; ETP-fw = Eco toxicity – freshwater; HTP-c = Human toxicity – cancer effects; HTP-nc = Human toxicity – non cancer effects; SQP = Soil Quality (dimensionless)															
	The numbers are declared in scientific notation, fx 1,95E+02. This number can also be written as: 1,95*102 or 195, while 1,12E-11 is the same as 1,12*10-11 or 0,0000000000112.															
Disclaimers	1 The results of this environmental indicator shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator.															
	2 This impact category deals mainly with the eventual impact of low dose ionizing radiation on human health of the nuclear fuel cycle. It does not consider effects due to possible nuclear accidents, occupational exposure nor due to radioactive waste disposal in underground facilities. Potential ionizing radiation from the soil, from radon and from some construction materials is also not measured by this indicator.															

Table 30: Parameters describing resource use - Group 5.

RESOURCE USE PER FIXTURE																
Parameter	**Unit**	**A1-A3**	**A4**	**A5**	**B1**	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**C1**	**C2**	**C3**	**C4**	**D**
PERE	MJ	3,11E+02	7,33E-01	-1,80E+01	0,00E+00	4,59E+02	6,79E-01	0,00E+00	0,00E+00	0,00E+00	1,69E+02	1,80E-01	7,93E-02	1,99E-02	9,89E-04	-2,26E-01
PERM	MJ	2,02E-01	0,00E+00	1,81E+01	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	0,00E+00
PERT	MJ	3,11E+02	7,33E-01	4,38E-02	0,00E+00	4,59E+02	6,79E-01	0,00E+00	0,00E+00	0,00E+00	1,69E+02	1,80E-01	7,93E-02	1,99E-02	9,89E-04	-2,26E-01
PENRE	MJ	7,27E+02	3,58E+01	1,24E+00	0,00E+00	3,04E+02	8,64E+00	0,00E+00	0,00E+00	0,00E+00	1,21E+03	8,44E-01	4,83E+00	7,34E-01	6,63E-02	-5,15E+00
PENRM	MJ	5,99E+00	0,00E+00	5,34E-01	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	0,00E+00
PENRT	MJ	7,33E+02	3,58E+01	1,78E+00	0,00E+00	3,04E+02	8,64E+00	0,00E+00	0,00E+00	0,00E+00	1,21E+03	8,44E-01	4,83E+00	7,34E-01	6,63E-02	-5,15E+00
SM	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	0,00E+00	0,00E+00	0,00E+00	0,00E+00
RSF	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	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
NRSF	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	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
FW	m^3	5,47E+01	1,38E-01	1,52E-02	0,00E+00	6,27E+01	5,31E-01	0,00E+00	0,00E+00	0,00E+00	8,36E+03	5,81E-06	1,80E-06	4,10E-07	1,83E-08	-6,83E-06
Caption	PERE = Use of renewable primary energy excluding renewable primary energy resources used as raw materials; PERM = Use of renewable primary energy resources used as raw materials; PERT = Total use of renewable primary energy resources; PENRE = Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials; PENRM = Use of non-renewable primary energy resources used as raw materials; PENRT = Total use of non-renewable primary energy resources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Net use of fresh water															
	The numbers are declared in scientific notation, fx 1,95E+02. This number can also be written as: 1,95*102 or 195, while 1,12E-11 is the same as 1,12*10-11 or 0,0000000000112.															

Table 31: End-of-life (waste categories and output flows) - Group 5.

WASTE CATEGORIES AND OUTPUT FLOWS PER FIXTURE																
Parameter	**Unit**	**A1-A3**	**A4**	**A5**	**B1**	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**C1**	**C2**	**C3**	**C4**	**D**
HWD	kg	2,37E-02	2,14E-04	1,03E-05	0,00E+00	1,15E-03	1,01E-04	0,00E+00	0,00E+00	0,00E+00	3,33E-03	1,41E-06	2,89E-05	3,91E-06	3,26E-07	-2,07E-05
NHWD	kg	2,03E+01	1,07E+00	1,94E-01	0,00E+00	3,64E+00	1,51E-01	0,00E+00	0,00E+00	0,00E+00	1,33E+01	3,24E-03	1,88E-01	4,08E-02	3,16E-01	-6,01E-02
RWD	kg	1,65E-03	1,66E-05	1,05E-06	0,00E+00	3,15E-04	6,87E-06	0,00E+00	0,00E+00	0,00E+00	6,22E-03	5,81E-06	1,80E-06	4,10E-07	1,83E-08	-6,83E-06
CRU	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	0,00E+00	0,00E+00	0,00E+00	0,00E+00
MFR	kg	4,42E+00	0,00E+00	8,50E-01	0,00E+00	0,00E+00	1,77E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	4,52E+00	0,00E+00	0,00E+00
MER	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	0,00E+00	0,00E+00	0,00E+00	0,00E+00
EEE	MJ	2,99E-03	0,00E+00	1,68E-01	0,00E+00	0,00E+00	1,45E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,68E-01	0,00E+00	0,00E+00
EET	MJ	2,87E-02	0,00E+00	1,62E+00	0,00E+00	0,00E+00	1,39E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,61E+00	0,00E+00	0,00E+00
Caption	HWD = Hazardous waste disposed; NHWD = Non-hazardous waste disposed; RWD = Radioactive waste disposed; CRU = Components for re-use; MFR = Materials for recycling; MER = Materials for energy recovery; EEE = Exported electrical energy; EET = Exported thermal energy															
	The numbers are declared in scientific notation, fx 1,95E+02. This number can also be written as: 1,95*102 or 195, while 1,12E-11 is the same as 1,12*10-11 or 0,0000000000112.															

Table 32: Biogenic carbon content - Group 5.

BIOGENIC CARBON CONTENT PER FIXTURE		
Parameter	**Unit**	**At the factory gate**
Biogenic carbon content in a product	kg C	0
Biogenic carbon content in accompanying packaging	kg C	0,56
Note	1 kg biogenic carbon is equivalent to 44/12 kg of CO_2	

Group 6: Exclusive color (PVD on Stainless steel) is represented by 321L-64 - Brushed copper

Table 33: Environmental impact indicators - Group 6.

ENVIRONMENTAL IMPACTS PER FIXTURE																
Parameter	**Unit**	**A1-A3**	**A4**	**A5**	**B1**	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**C1**	**C2**	**C3**	**C4**	**D**
GWP- total	kg CO_2-eq.	5,11E+01	2,43E+00	6,62E-01	0,00E+00	8,93E+00	6,25E-01	0,00E+00	0,00E+00	0,00E+00	6,54E+01	3,67E-02	3,29E-01	2,37E-01	2,00E-02	-3,42E-01
GWP-fossil	kg CO_2-eq.	5,10E+01	2,43E+00	1,46E-01	0,00E+00	1,59E+01	5,97E-01	0,00E+00	0,00E+00	0,00E+00	6,39E+01	3,54E-02	3,28E-01	2,33E-01	8,42E-03	-3,23E-01
GWP-biogenic	kg CO_2-eq.	-3,90E-01	0,00E+00	4,95E-01	0,00E+00	5,25E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,34E+00	1,23E-03	0,00E+00	0,00E+00	0,00E+00	-1,25E-03
GWP- luluc	kg CO_2-eq.	1,18E-01	1,42E-03	5,71E-05	0,00E+00	1,11E+01	4,77E-04	0,00E+00	0,00E+00	0,00E+00	1,12E-01	8,83E-05	1,50E-04	3,28E-05	1,98E-06	-1,51E-04
ODP	kg CFC 11 -eq.	7,54E-07	5,28E-08	2,53E-09	0,00E+00	1,03E-06	4,49E-09	0,00E+00	0,00E+00	0,00E+00	1,81E-06	6,75E-10	7,15E-09	1,12E-09	6,94E-11	-1,07E-08
AP	mol H^{+} eq.	2,61E+00	7,44E-03	5,61E-04	0,00E+00	1,42E-01	1,39E-02	0,00E+00	0,00E+00	0,00E+00	3,50E-01	2,03E-04	1,02E-03	2,59E-04	2,06E-05	-8,05E-04
EP-freshwater	kg P-eq.	2,05E-01	2,06E-04	1,32E-05	0,00E+00	5,92E-03	1,02E-03	0,00E+00	0,00E+00	0,00E+00	4,24E-02	3,35E-05	2,26E-05	6,08E-06	5,08E-07	-4,75E-05
EP- marine	kg N-eq.	1,49E-01	2,40E-03	4,47E-04	0,00E+00	1,13E-01	1,27E-03	0,00E+00	0,00E+00	0,00E+00	6,82E-02	3,28E-05	3,50E-04	1,05E-04	3,43E-05	-2,74E-04
EP-terrestrial	mol N-eq.	1,98E+00	2,52E-02	2,14E-03	0,00E+00	4,62E-01	1,22E-02	0,00E+00	0,00E+00	0,00E+00	6,54E-01	2,97E-04	3,69E-03	1,07E-03	8,01E-05	-2,72E-03
POCP	kg NMVOC-eq.	5,65E-01	1,08E-02	8,70E-04	0,00E+00	9,33E-02	3,62E-03	0,00E+00	0,00E+00	0,00E+00	2,39E-01	9,54E-05	1,53E-03	3,54E-04	3,20E-05	-1,11E-03
ADPE	kg Sb-eq.	3,53E-02	1,06E-05	4,72E-07	0,00E+00	1,76E-04	1,71E-04	0,00E+00	0,00E+00	0,00E+00	3,36E-04	4,29E-07	1,05E-06	1,71E-07	5,23E-09	-8,54E-07
ADPF	MJ	6,54E+02	3,41E+01	1,67E+00	0,00E+00	2,69E+02	8,05E+00	0,00E+00	0,00E+00	0,00E+00	1,15E+03	8,05E-01	4,62E+00	7,00E-01	6,20E-02	-4,75E+00
WDP	m^3	4,44E+01	1,41E-01	1,52E-02	0,00E+00	6,47E+01	5,41E-01	0,00E+00	0,00E+00	0,00E+00	8,77E+03	9,07E-03	1,75E-02	1,01E-02	2,64E-03	-2,29E-02
Caption	GWP-total = Global Warming Potential - total; GWP-fossil = Global Warming Potential - fossil fuels; GWP-biogenic = Global Warming Potential - biogenic; GWP-luluc = Global Warming Potential - land use and land use change; ODP = Ozone Depletion; AP = Acidification; EP-freshwater = Eutrophication – aquatic freshwater; EP-marine = Eutrophication – aquatic marine; EP-terrestrial = Eutrophication – terrestrial; POCP = Photochemical zone formation; ADPm = Abiotic Depletion Potential – minerals and metals; ADPf = Abiotic Depletion Potential – fossil fuels; WDP = water use															
	The numbers are declared in scientific notation, fx 1,95E+02. This number can also be written as: 1,95*102 or 195, while 1,12E-11 is the same as 1,12*10-11 or 0,0000000000112.															
Disclaimer	1 The results of this environmental indicator shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator.															

Table 34: Additional environmental impacts - Group 6.

ADDITIONAL ENVIRONMENTAL IMPACTS PER FIXTURE																
Parameter	**Unit**	**A1-A3**	**A4**	**A5**	**B1**	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**C1**	**C2**	**C3**	**C4**	**D**
PM	Disease Incidence	6,98E-06	1,42E-07	1,10E-08	0,00E+00	2,02E-06	1,10E-07	0,00E+00	0,00E+00	0,00E+00	3,63E-06	7,44E-10	2,24E-08	4,53E-09	4,24E-10	-1,09E-08
IRP	kBq U235 eq	2,47E+01	6,81E-02	4,20E-03	0,00E+00	1,26E+00	2,67E-02	0,00E+00	0,00E+00	0,00E+00	2,43E+01	2,27E-02	7,46E-03	1,67E-03	7,59E-05	-2,68E-02
ETP-fw	CTUe	3,74E+03	1,81E+01	1,69E+00	0,00E+00	5,34E+02	1,88E+01	0,00E+00	0,00E+00	0,00E+00	2,93E+02	1,35E-01	2,34E+00	6,49E-01	7,09E-02	-8,72E-01
HTP-c	CTUh	4,63E-07	1,24E-09	8,84E-11	0,00E+00	2,96E-08	2,05E-09	0,00E+00	0,00E+00	0,00E+00	2,82E-07	1,66E-11	1,37E-10	4,37E-11	2,09E-12	-1,13E-10
HTP-nc	CTUh	3,41E-05	2,39E-08	2,07E-09	0,00E+00	6,85E-07	1,67E-07	0,00E+00	0,00E+00	0,00E+00	3,69E-06	6,63E-10	3,07E-09	9,20E-10	4,58E-11	-1,81E-09
SQP	-	9,39E+02	1,42E+01	8,05E-01	0,00E+00	8,50E+02	4,62E+00	0,00E+00	0,00E+00	0,00E+00	2,50E+02	1,57E-01	2,37E+00	5,06E-01	1,30E-01	-8,76E-01
Caption	PM = Particulate Matter emissions; IRP = Ionizing radiation – human health; ETP-fw = Eco toxicity – freshwater; HTP-c = Human toxicity – cancer effects; HTP-nc = Human toxicity – non cancer effects; SQP = Soil Quality (dimensionless)															
	The numbers are declared in scientific notation, fx 1,95E+02. This number can also be written as: 1,95*102 or 195, while 1,12E-11 is the same as 1,12*10-11 or 0,0000000000112.															
Disclaimers	1 The results of this environmental indicator shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator.															
	2 This impact category deals mainly with the eventual impact of low dose ionizing radiation on human health of the nuclear fuel cycle. It does not consider effects due to possible nuclear accidents, occupational exposure nor due to radioactive waste disposal in underground facilities. Potential ionizing radiation from the soil, from radon and from some construction materials is also not measured by this indicator.															

Table 35: Parameters describing resource use - Group 6.

RESOURCE USE PER FIXTURE																
Parameter	**Unit**	**A1-A3**	**A4**	**A5**	**B1**	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**C1**	**C2**	**C3**	**C4**	**D**
PERE	MJ	3,25E+02	7,43E-01	-1,80E+01	0,00E+00	4,59E+02	6,79E-01	0,00E+00	0,00E+00	0,00E+00	1,69E+02	1,80E-01	8,05E-02	2,01E-02	9,86E-04	-2,26E-01
PERM	MJ	2,02E-01	0,00E+00	1,81E+01	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	0,00E+00
PERT	MJ	3,25E+02	7,43E-01	4,38E-02	0,00E+00	4,59E+02	6,79E-01	0,00E+00	0,00E+00	0,00E+00	1,69E+02	1,80E-01	8,05E-02	2,01E-02	9,86E-04	-2,26E-01
PENRE	MJ	6,91E+02	3,63E+01	1,24E+00	0,00E+00	3,04E+02	8,64E+00	0,00E+00	0,00E+00	0,00E+00	1,21E+03	8,44E-01	4,91E+00	7,45E-01	6,60E-02	-5,16E+00
PENRM	MJ	5,99E+00	0,00E+00	5,34E-01	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	0,00E+00
PENRT	MJ	6,97E+02	3,63E+01	1,78E+00	0,00E+00	3,04E+02	8,64E+00	0,00E+00	0,00E+00	0,00E+00	1,21E+03	8,44E-01	4,91E+00	7,45E-01	6,60E-02	-5,16E+00
SM	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	0,00E+00	0,00E+00	0,00E+00	0,00E+00
RSF	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	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
NRSF	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	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
FW	m^3	4,61E+01	1,40E-01	1,52E-02	0,00E+00	6,27E+01	5,31E-01	0,00E+00	0,00E+00	0,00E+00	8,36E+03	5,81E-06	1,83E-06	4,15E-07	1,82E-08	-6,84E-06
Caption	PERE = Use of renewable primary energy excluding renewable primary energy resources used as raw materials; PERM = Use of renewable primary energy resources used as raw materials; PERT = Total use of renewable primary energy resources; PENRE = Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials; PENRM = Use of non-renewable primary energy resources used as raw materials; PENRT = Total use of non-renewable primary energy resources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Net use of fresh water															
	The numbers are declared in scientific notation, fx 1,95E+02. This number can also be written as: 1,95*102 or 195, while 1,12E-11 is the same as 1,12*10-11 or 0,0000000000112.															

Table 36: End-of-life (waste categories and output flows) - Group 6.

WASTE CATEGORIES AND OUTPUT FLOWS PER FIXTURE																
Parameter	**Unit**	**A1-A3**	**A4**	**A5**	**B1**	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**C1**	**C2**	**C3**	**C4**	**D**
HWD	kg	1,90E-02	2,17E-04	1,03E-05	0,00E+00	1,15E-03	1,01E-04	0,00E+00	0,00E+00	0,00E+00	3,33E-03	1,41E-06	2,93E-05	3,97E-06	3,24E-07	-2,07E-05
NHWD	kg	2,48E+01	1,09E+00	1,94E-01	0,00E+00	3,64E+00	1,51E-01	0,00E+00	0,00E+00	0,00E+00	1,33E+01	3,24E-03	1,90E-01	4,15E-02	3,15E-01	-6,08E-02
RWD	kg	1,51E-03	1,68E-05	1,05E-06	0,00E+00	3,15E-04	6,87E-06	0,00E+00	0,00E+00	0,00E+00	6,22E-03	5,81E-06	1,83E-06	4,15E-07	1,82E-08	-6,84E-06
CRU	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	0,00E+00	0,00E+00	0,00E+00	0,00E+00
MFR	kg	4,31E+00	0,00E+00	8,50E-01	0,00E+00	0,00E+00	1,77E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	4,59E+00	0,00E+00	0,00E+00
MER	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	0,00E+00	0,00E+00	0,00E+00	0,00E+00
EEE	MJ	2,99E-03	0,00E+00	1,68E-01	0,00E+00	0,00E+00	1,45E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,68E-01	0,00E+00	0,00E+00
EET	MJ	2,87E-02	0,00E+00	1,62E+00	0,00E+00	0,00E+00	1,39E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,61E+00	0,00E+00	0,00E+00
Caption	HWD = Hazardous waste disposed; NHWD = Non-hazardous waste disposed; RWD = Radioactive waste disposed; CRU = Components for re-use; MFR = Materials for recycling; MER = Materials for energy recovery; EEE = Exported electrical energy; EET = Exported thermal energy															
	The numbers are declared in scientific notation, fx 1,95E+02. This number can also be written as: 1,95*102 or 195, while 1,12E-11 is the same as 1,12*10-11 or 0,0000000000112.															

Table 37: Biogenic carbon content - Group 6.

BIOGENIC CARBON CONTENT PER FIXTURE		
Parameter	**Unit**	**At the factory gate**
Biogenic carbon content in a product	kg C	0
Biogenic carbon content in accompanying packaging	kg C	0,56
Note	1 kg biogenic carbon is equivalent to 44/12 kg of CO_2	

Additional information

LCA interpretation

The hotspot analysis identified the areas where improvements can be made to reduce the environmental impact on VOLA's products. The hotspot analysis has identified that brass and steel have the highest material contribution to the overall environmental impact. These two materials are the main part of the product, and the contribution analysis of the potential environmental impacts showed also that they cause the highest impact among the other materials of the product.

Module B7, Operational water use is associated with the highest environmental impact because the scenario is based on a Reference Service Life of 30 years, with an assumption of results of 208 m^3 (spouts 010 and 020) water consumption for a default scenario of 1,9 l/min and 20 use cycles per day, or with an assumption of results of 383 m^3 (spouts 030) water consumption for a default scenario of 3,5 l/min and 20 use cycles per day.

Technical information on scenarios

Table 38: Average transport to the building site (A4)

Scenario information	Value	Unit
Fuel type	Diesel	-
Vehicle type	Euro 5	-
Average transport distance	Group 1: 321L - 16: 879 km Group 2: 321 - 19: 1.276 km Group 3: 321L - 40: 879 km Group 4: 321L - 27: 879 km Group 5: 321L - 60: 879 km Group 6: 321L - 64: 879 km	km
Capacity utilization (including empty runs)	85 % for trucks	%
Gross density of products transported	930 kg/m^3 (with lorry) 697 kg/m^3 (with flight) 442 kg/m^3 (with steel cage)	kg/m^3
Capacity utilization volume factor	1	-

Table 39: Installation of the product in the building (A5)

Scenario information	Value						Unit
Ancillary materials	Installation is simple and does not entail any relevant energy consumption or use of materials. Mounting instructions are included with the product or can be downloaded on www.VOLA.com Packaging materials are cardboard, paper, and LDPE.						kg
Water use	Not relevant						m^3
Other resource use	Not relevant						kg
Energy type and consumption	Not relevant						kWh
Waste materials	Materials	Group 1 321L-16	Group 2 321-19	Group 3 321L-40	Group 4 321-27	Group 5 321L-60	kg
	LDPE	0,012	0,013	0,012	0,013	0,013	
	Cardboard	1,058	1,087	1,058	1,087	1,087	
	Paper	0,026	0,042	0,026	0,042	0,042	
	Wooden pallet	7,05E-05	7,88E-05	7,15E-05	7,95E-05	8,07E-05	
	SUMMARY	**1,095**	**1,141**	**1,095**	**1,141**	**1,141**	
	Materials	Group 6 321L-64					
	LDPE	0,013					
	Cardboard	1,087					
	Paper	0,042					
	Wooden pallet	8,16E-05					
	SUMMARY	**1,141**					
Output materials for recycling	Materials	Group 1 321L-16	Group 2 321-19	Group 3 321L-40	Group 4 321-27	Group 5 321L-60	kg
	LDPE	0,003	0,004	0,003	0,004	0,004	
	Cardboard	0,793	0,815	0,793	0,815	0,815	
	Paper	0,019	0,031	0,019	0,031	0,031	
	SUMMARY	**0,816**	**0,850**	**0,816**	**0,850**	**0,850**	
	Materials	Group 6 321L-64					
	LDPE	0,004					
	Cardboard	0,815					
	Paper	0,031					
	SUMMARY	**0,850**					
Output materials for incineration	Materials	Group 1 321L-16	Group 2 321-19	Group 3 321L-40	Group 4 321-27	Group 5 321L-60	kg
	LDPE	0,004	0,005	0,004	0,005	0,005	
	Cardboard	0,145	0,149	0,145	0,149	0,149	
	Paper	0,004	0,006	0,004	0,006	0,006	
	Wooden pallet	0,0001	0,0001	0,0001	0,0001	0,0001	
	SUMMARY	**0,153**	**0,160**	**0,153**	**0,160**	**0,160**	
	Materials	Group 6 321L-64					
	LDPE	0,005					
	Cardboard	0,149					
	Paper	0,006					
	Wooden pallet	0,0001					
	SUMMARY	**0,160**					

Output materials for landfill	Materials	Group 1 321L-16	Group 2 321-19	Group 3 321L-40	Group 4 321-27	Group 5 321L-60	kg
	LDPE	0,004	0,004	0,004	0,004	0,004	
	Cardboard	0,119	0,122	0,119	0,122	0,122	
	Paper	0,003	0,005	0,003	0,005	0,005	
	SUMMARY	**0,126**	**0,131**	**0,126**	**0,131**	**0,131**	
	Materials	Group 6 321L-64					
	LDPE	0,004					
	Cardboard	0,122					
	Paper	0,005					
	SUMMARY	**0,131**					
Direct emissions to air, soil, or water	0						kg

Table 40: Reference service life

RSL information	Unit
Reference service Life	30 Years
Declared product properties	As appropriate
Design application parameters	As appropriate
Assumed quality of work	As appropriate
Outdoor environment	As appropriate
Indoor environment	As appropriate
Usage conditions	As appropriate
Maintenance	As appropriate

Table 41: Use (B1-B7)

Scenario information	Value						Unit
B1 – Use							
	100 series is a build in single-lever mixer for control of both the water temperature and the water flow. The technical operating scenario is available in the "Consumption data" (B6-B7).						
B2 - Maintenance							
Maintenance process	Maintenance instructions are included with the VOLA product and can also be downloaded on www.vola.com						-
Maintenance cycle	Once per week = 1.560 times per RSL						/RSL
Ancillary materials for maintenance (specify which)	Cloth, little soap for cleaning, cotton bud, and detergents that are meant for the cleaning surface of the product (according to the maintenance instructions included in the VOLA product). Soap (7,8 kg/RSL) Water (816 l/RSL)) Acetic acid (3,6 l/RSL))						kg/RSL
Waste materials resulting from the maintenance (specify which)	0						kg
Net freshwater consumption during maintenance	0,816						m^3
Energy input during maintenance	0						kWh
B3 – Repair							
Repair process	The product is made of parts that can be changed and replaced by new parts. Inspection is performed and a description of needed repair is noted on a sales order in agreement with the customer and Technical Support. The repair is conducted and the product and returned to the customer. If repair is impossible, the customer will be contacted by technical support and a new product can be offered.						-
Inspection process	As part of the repair process.						-
Repair cycle	0,1						/year
Ancillary materials (specify which)	NA						kg/RSL
Waste materials (specify which)	Materials	Group 1 321L-16	Group 2 321-19	Group 3 321L-40	Group 4 321-27	Group 5 321L-60	kg/RSL
	Hoses (Steel) **Cartridges** (Ceramic, Brass, Plastic) **Pilator** (Plastic) **SUMMARY**	0,000 0,0461 0,0016 **0,0477**	0,000 0,0461 0,0016 **0,0477**	0,000 0,0461 0,0016 **0,0477**	0,000 0,0461 0,0016 **0,0477**	0,000 0,0461 0,0016 **0,0477**	

	Materials	Group 6 321L-64					
	Hoses (Steel) **Cartridges** (Ceramic, Brass, Plastic) **Pilator** (Plastic) **SUMMARY**	0,000 0,0461 0,0016 **0,0477**					
Net freshwater consumption during repair	0						m^3
Energy input during repair	0						kg/RSL
B6 + B7 – Use of energy and water							
Ancillary materials specified by material	Not specified						kg
Net freshwater consumption	The spouts 010 and 020 (111, 111L, 111M, 112, 112L, 112M, 121, 121L, 121M, 122, 122L, 122M, 311, 311L, 311M, 321, 321L, 321M): **208 m^3** (20 cycles per day, 30 sec. lengths of use cycle, lifespan of 30 years) with 1,9 l/min flow rate.						m^3
Type of energy carrier	0						kWh/RSL
The power output of equipment	0						kW
Characteristic performance	Not specified						As appropriate
Further assumptions for scenario development	Not specified						As appropriate

Table 42: End of life (C1-C4)

Scenario information		Value					Unit
Collected separately	**SUMMARY**	Group 1 321L-16	Group 2 321-19	Group 3 321L-40	Group 4 321-27	Group 5 321L-60	kg
		4,19E+00	4,77E+00	4,25E+00	4,82E+00	4,91E+00	
		Group 6 321L-64					
		4,98E+00					
Collected with mixed waste		-					kg
For reuse		0					kg
For recycling	**SUMMARY**	Group 1 321L-16	Group 2 321-19	Group 3 321L-40	Group 4 321-27	Group 5 321L-60	kg
		2,78E+00	3,29E+00	2,35E+00	3,28E+00	3,34E+00	
		1,09E-01	1,03E-01	1,01E-01	1,03E-01	1,09E-01	
		3,19E-02	3,22E-02	3,19E-02	3,22E-02	3,22E-02	
		1,10E-02	1,14E-02	5,26E-01	2,85E-02	1,14E-02	
		9,48E-01	9,50E-01	9,48E-01	9,98E-01	1,03E+00	
		3,88E+00	**4,39E+00**	**3,95E+00**	**4,44E+00**	**4,52E+00**	
		Group 6 321L-64					
		2,90E+00					
		1,01E-01					
		3,22E-02					
		5,31E-01					
		1,02E+00					
		4,59E+00					
For energy recovery	**SUMMARY**	Group 1 321L-16	Group 2 321-19	Group 3 321L-40	Group 4 321-27	Group 5 321L-60	kg
		3,00E-03	3,00E-03	3,00E-03	3,00E-03	3,00E-03	
		4,70E-02	4,90E-02	4,70E-02	4,90E-02	4,90E-02	
		4,95E-04	2,14E-02	4,95E-04	2,14E-02	2,14E-02	
		5,04E-02	**7,34E-02**	**5,04E-02**	**7,34E-02**	**7,34E-02**	
		Group 6 321L-64					
		3,00E-03					
		4,90E-02					
		2,14E-02					
		7,34E-02					
For landfill	**SUMMARY**	Group 1 321L-16	Group 2 321-19	Group 3 321L-40	Group 4 321-27	Group 5 321L-60	kg
		1,46E-01	1,73E-01	1,24E-01	1,73E-01	1,76E-01	
		1,54E-02	1,54E-02	1,54E-02	1,54E-02	1,54E-02	
		1,25E-02	8,08E-03	6,88E-03	8,08E-03	1,25E-02	
		3,85E-02	4,02E-02	3,85E-02	4,02E-02	4,02E-02	
		4,05E-04	1,75E-02	4,05E-04	1,75E-02	1,75E-02	
		5,80E-04	6,00E-04	2,77E-02	1,50E-03	6,00E-04	
		4,99E-02	5,00E-02	4,99E-02	5,25E-02	5,42E-02	
		2,63E-01	**3,05E-01**	**2,62E-01**	**3,08E-01**	**3,16E-01**	

		Group 6 321L-64					
		1,53E-01 1,54E-02 6,88E-03 4,02E-02 1,75E-02 2,79E-02 5,39E-02 **3,14E-01**					
Assumptions for scenario development	-						As appropriate

Table 43: Re-use, recovery, and recycling potential (D)

Scenario information/Material	Value					Unit
	Group 1 321L-16	Group 2 321-19	Group 3 321L-40	Group 4 321-27	Group 5 321L-60	
Electrical energy recovered	0,28	0,35	0,28	0,35	0,35	MJ
Thermal energy recovered	2,71	3,36	2,71	3,36	3,37	MJ
Materials recovery	4,43	4,95	4,50	5,00	5,07	kg
	Group 6 321L-64					
Electrical energy recovered	0,35					MJ
Thermal energy recovered	3,37					MJ
Materials recovery	5,14					kg

Indoor air

The EPD does not give information on the release of dangerous substances to the indoor air because the horizontal standards on measurement of the release of regulated dangerous substances from construction products using harmonized test methods according to the provisions of the respective technical committees for European product standards are not available.

Soil and water

The EPD does not give information on the release of dangerous substances to soil and water because the horizontal standards on measurement of the release of regulated dangerous substances from construction products using harmonized test methods according to the provisions of the respective technical committees for European product standards are not available.

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