

Owner: Combimix Aps
No.: MD-22130-EN
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Valid to: xx-xx-2028

3rd PARTY VERIFIED

EPD

VERIFIED ENVIRONMENTAL PRODUCT DECLARATION | ISO 14025 & EN 15804



Owner of declaration

Combimix ApS, Marktoften 6,
DK-8464 Galten, CVR-Nr.
DK-36934379


Issued:

xx-xx-2023

Valid to:

xx-xx-2028

Programme

EPD Danmark
www.epddanmark.dk



- ☐ Industry EPD
☒ Product EPD

Declared product(s)

CM Flow Casting
CM Flow casting fiber
CM Project
CM Project Fiber
CM Project Selfdrying
CM 720 fine
CM 750 S
CM 760 Fiber
CM 920 Industrial
CM 940 Industrial Top

Number of declared datasets/product variations: 10

Production site

Marktoften 6, DK 8464 Galten, Denmark

Product(s) use

Combimix products are used as cement based, plastic- and fiber-reinforced products. Suitable for fast-hardening repair and putty compounds for floors, in wet and dry rooms.

Declared/ functional unit

This EPD refers to the declared unit of 1 kg tile mortar product with a density of 1100 - 2200 kg/m³.

Year of production site data (A3)

2021

EPD version

This is the original version of the EPD.

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:

Ninkie Bendtsen

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	MND	MND	MND	MND	MND	MND	MND	X	X	X	X	X

Product information

Product description

The main product components are shown in Table 1. Specific recipes are used, and the composition of input materials is 100 % in mass -% of declared products.

Table 1: Material composition of products

Product	Material / component	Weight-% of declared product
CM Flow Casting	Cement	29%
	Sand	54%
	Calcium carbonate	12%
	Additives	5%
CM Flow casting fiber	Cement	29%
	Sand	54%
	Calcium carbonate	12%
	Additives	5%
CM Project	Cement	36%
	Sand	54%
	Calcium carbonate	2%
	Additives	8%
CM Project Fiber	Cement	36%
	Sand	54%
	Calcium carbonate	2%
	Additives	8%
CM Project Selfdrying	Cement	30%
	Sand	57%
	Calcium carbonate	2%
	Additives	11%
CM 720 fine	Cement	38%
	Sand	50%
	Calcium carbonate	3%
	Additives	10%
CM 750 S	Cement	44%
	Sand	22%
	Calcium carbonate	22%
	Additives	13%
CM 760 Fiber	Cement	30%
	Sand	56%

	Calcium carbonate	2%
	Additives	11%
CM 920 Industrial	Cement	30%
	Sand	55%
	Calcium carbonate	2%
	Additives	13%
CM 940 Industrial Top	Cement	27%
	Sand	5%
	Calcium carbonate	21%
	Additives	47%

Product packaging:

There is no material used for the sales- and transport packaging of the product, since it is delivered in bulk directly to the customers, via truck.

Representativity

This declaration, including data collection and the modeled foreground system including results, represents the production of 1 kg of product on the production sites located in Galten. Product specific data are based on average values collected in the year 2021. Background data are based on SimaPro 9.3 with database of EcoInvent 3.8 and are less than 10 years old. Generally, the used background datasets are of high quality, and the majority of the datasets are only a couple of years old.

Hazardous substances

During the life cycle of the product no hazardous substance listed in the "Candidate List of Substances of Very High Concern (SVHC) for authorization" has been used in a percentage higher than 0.1% of the weight of the product.

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

Essential characteristics

The products are designed, produced and CE marked according to EN 13813:2002 Screed material and floor screeds. Screed material. Properties and requirements.

They are classified as seen in Tables 2 and 3 according to EN 13813:2002 Screed material and floor screeds.

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

<https://www.combimix.com/us/products/floor-leveling/industrial-floors/>

Table 2: Technical specifications of Combimix floor screeds products part 1

	CM Flow casting	CM Flow casting fiber	CM Project	CM Project fiber	CM Project Selfdrying
Standard	EN 13813	EN 13813	EN 13813	EN 13813	EN 13813
Density (kg/m³)	1700	1700	1700	1700	1700
Reaction to fire	Class A1	Class A1	Class A1	Class A1	Class A1
Product class acc. to EN 13813	CT C20F4	CT C20F4	CT C30F5	CT C30F5	CT C30F6
Open time	30 min	30 min	30 min	30 min	30 min
Slip	0,04–0,08 %	0,04–0,08 %	0,04 %	0,04 %	0,04 %

Table 3: Technical specifications of Combimix floor screed products part 2

	CM 720	CM 750 S	CM 760 Fiber	CM 920 Industrial	CM 940 Industrial Top
Standard	EN 13813	EN 13813	EN 13813	EN 13813	EN 13813
Density (kg/m³)	1600	1600	1700	1700	1600
Reaction to fire	Class A1	Class A1	Class A1	Class A1	Class A1
Product class acc. to EN 13813	CT C30F6	CT C25F6	CT C30F7	CT C30F8	CT C30F8
Open time	10-25 min	10-20 min	10-25 min	15-25 min	15-25 min
Slip	0,03–0,05 %	0,03–0,05 %	0,03–0,05 %	0,03–0,05 %	0,03–0,05 %

Reference Service Life (RSL)

The B1-B7 stage is not relevant as it is not applicable. Thus, this EPD does not include a Reference Service Life and the environmental impacts related to this stage have not been studied. Air, soil, and water impacts during the use phase have not been studied.

Picture of product(s)



Figure 1: Picture of products

LCA background

Declared unit/ Functional Unit

Declared unit is taken as the input of materials in order to produce 1 kg of product.

The LCI and LCIA results in this EPD relate to 1 kg of product from Combimix for the products: CM Flow Casting, CM Flow casting fiber, CM Projekt, CM Projekt Fiber, CM Projekt Selfdrying, CM 720 fine, CM 750 S, CM 760 Fiber, CM 920 Industrial, CM 940 Industrial Top.

Table 4: Declared unit

Name	Value	Unit
Declared unit	1	kg
Density	CM Flow casting: 1700 Kg/m ³ CM Flow casting fiber: 1700 Kg/m ³ CM Projekt: 1700 Kg/m ³ CM Projekt Fiber: 1700 Kg/m ³ CM Projekt Selfdrying: 1700 Kg/m ³ CM 720: 1600 Kg/m ³ CM 750 S: 1600 Kg/m ³ CM 760 fiber: 1700 Kg/m ³ CM 920 Industrial: 1700 Kg/m ³ CM 940 Industrial top: 1600 Kg/m ³	Kg/m ³
Conversion factor to 1 kg	1	-

PCR

This EPD is developed according to the core rules for the product category of construction products in EN 15804:2012+A2, PCR 2019:14 Construction products Version 1.11. Sub-PCR-A Mortars applied to a surface (construction product) (2021-11-08) for the floor screed products requires 1 m² as functional unit, but in this case was not used to select the declared unit, but only as reference on how scenario phases (A4-D) should be modeled and how values and data must be obtained for the product type. Declared unit is 1 kg of finished product according to EN 15804:2012+A2. The reason for using 1 kg of declared unit is because the product consumption, of course, depends on the size of the tile, unevenness, grout size. Therefore, for better readiness of the report by the target audience, the potential impact results per declared unit and the customer and R&D department can calculate the results based on the desired thickness. The mixing ratio required for processing the components is in accordance with the

information in PCR for construction products version 1.11.

Guarantee of Origin – certificates

Foreground system:

The product is produced using country average mix for production in the site of Denmark.

Background system:

Upstream processes are modelled using an average country mix for production in the site of Denmark. Downstream processes are modelled using an average country mix since the product is shipped throughout Europe.

System boundary

This EPD is based on a cradle-to-gate with options and covers the life cycle sub-modules A1-A3, A4, A5, C1-C4, and D, in which 100 weight-% has been accounted for.

The general rules for cut-off 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.

The system boundaries of this EPD include Module A1, A2, A3, A4, A5, C2, C4, and Module D.

Table 5: System boundary according to EN 15804:2012+A2:2019.

System boundary (X = included in LCA; MND = module not declared)																
Product			Construction process		Use							End of life				Beyond system boundary
Raw material supply	Transport	Manufacturing	Transport	Construction installation process	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction demolition	Transport	Waste processing	Disposal	Reuse- recovery- recycling potential
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
X	X	X	X	X	MND	MND	MND	MND	MND	MND	MND	X	X	X	X	X

Flowdiagram

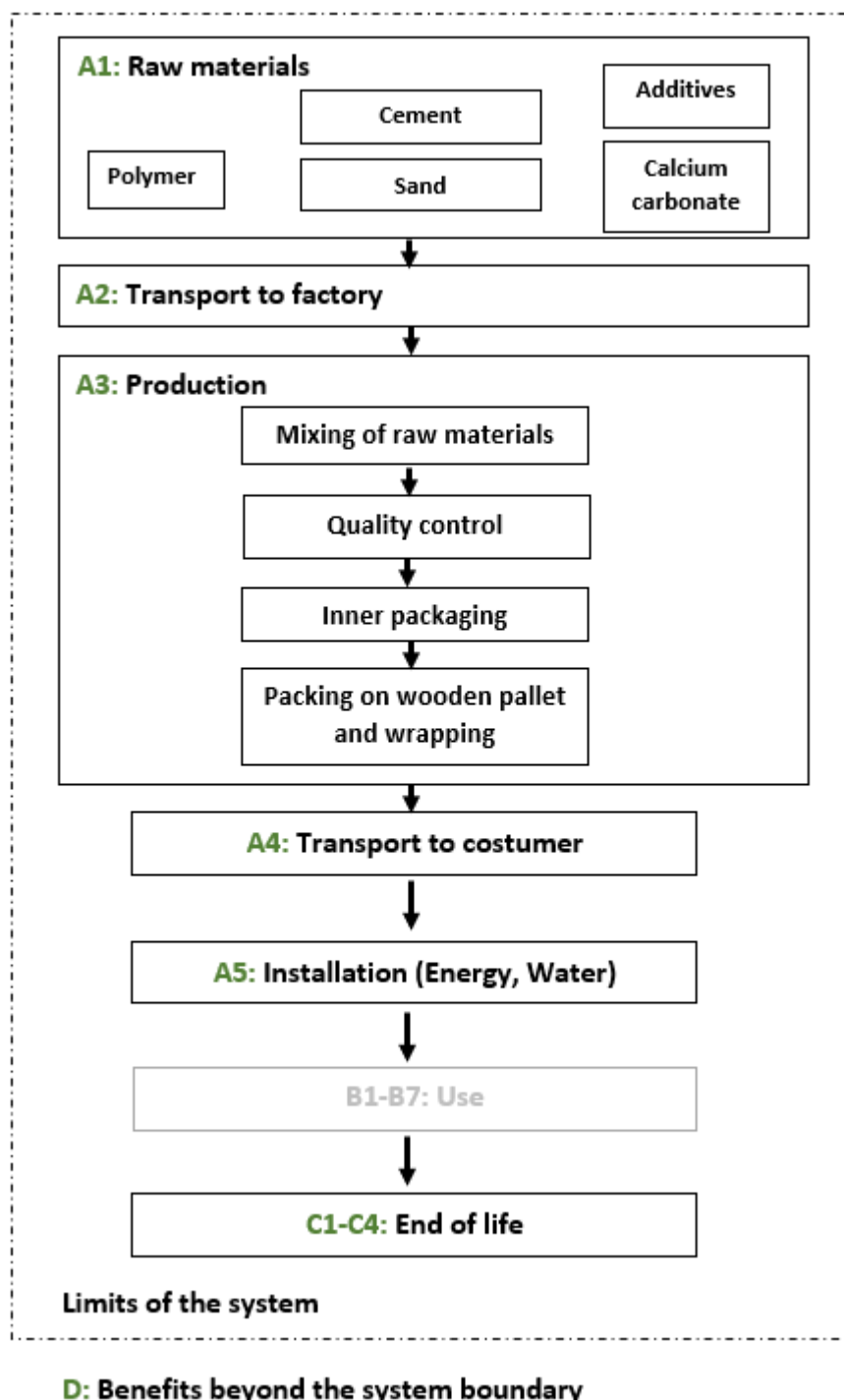


Figure 2: Flow diagram of product system with modules A1-D. B1-B7 modules are not included in the declaration.

The Flow diagram (**Error! Reference source not found.**) conforms with the requirements of the modular approach and shows all phases. All phases are described below. Use phase B1-B7 is not declared in this EPD.

Product stage (A1-A3) includes:

A1 – Extraction and processing of raw materials

A2 – Transport to the production site

A3 – Manufacturing processes

This product stage includes the acquisition of all raw materials, products, 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 one production site.

A1: The extraction, supply and transport of raw materials and their packaging to Combimix ApS is included here. Raw materials are purchased from European suppliers. Generic data from the Ecoinvent 3.8 database for raw material production has been coupled with primary activity data from recipes.

All semifinished products are represented as primary materials. Components from polymers, cement additives and calcium carbonate are preproduced from suppliers. The materials that are used to pack all raw materials are cardboard, paper, wood, and plastic big bags. Cement and sand materials are delivered in bulk due to considerable amounts transported. Thus, no packaging is considered for these materials.

There is no material used for the final product, since it is delivered in bulk directly to the customers, via truck.

A2: The raw materials are transported to the manufacturing site. The modelling includes road and/or maritime transportations of each raw material from 2021.

A3: The processing of any waste arising from this stage is also included. The main raw material is sand cement, and calcium carbonate. These materials constitute 80-90 % of the total product. Cement is received in different types: aluminat cement and Portland cement. The remaining 10-20 % of the products consists of additives.

The rest of the components are mainly different kinds of additives of inorganic nature but in a much smaller amount.

Specific data for the product content, its packaging and waste management from the same process are given by

Combimix ApS. Combimix ApS gets all their electricity from an electricity provider. The amount of energy in MJ is derived by the total energy consumption at the location of Combimix ApS in Galten is divided by the total production volume of all their products in the factory.

The disposal of the packaging of raw materials is taken into account at this stage. Of the packaging, 100 % is incinerated due to it having been in direct contact with concrete. For the product, 100 % is sent to landfill due to it being non-recyclable.

Transportation to the recycling, incineration and landfill stations is covered by a European average EURO 5 lorry 16-32 tons with a diesel engine.

Construction process stage (A4-A5) includes:

A4: The product is sold directly to customers or stores where the product is sold to others. The distance is calculated by finding the distance between the production site and the customer on the Danish market for each product. For all products produced in Denmark, the customers are located in Denmark. These distances are then averaged to produce a representative value. Not only the current fleet mix with primarily Euro 5 vehicles but also vehicle loading with an average of 5 t and effective distances is included, see Table 47: Transport to the building site (A4) .

A5: The installation of the product into the building requires water and energy for blending the raw materials. Mixing electricity consumption is estimated as 0,216 MJ/kg. This is equivalent to the use of a 1200-Watt handheld mixer for 3 minutes, see Table 48: Installation of the product in the building (A5) part 1 and Table 49: Installation of the product in the building (A5) part 2.

Use stage (B1-B7) includes:

B1 to B7 are not declared as they are not applicable: the product does not need maintenance or replacement during its RSL. Thus, this EPD does not include the product use and maintenance stage (B1-B7) and the environmental impacts related to this stage have not been studied. Air, soil, and water impacts during the use phase have not been studied.

End of Life (C1-C4) includes:

The end-of-life stage analyses the impacts related to the disposal of self-levelling compounds on a surface when that surface reaches the end of its service life, see Table 51. The consumption of energy and natural resources is considered negligible for disassembling end-of-life products. Therefore, the impact of demolition is considered zero in Module (C1). Module (C2) includes the transport of the self-levelling compound waste to the closest disposal facilities. All end-of-life product is sent to the closest disposal facilities, estimating a transportation distance equal to 50 km via road transport by a Euro 5 lorry of 16-32 metric ton. This parameter is also recommended to use by the sub-PCR 2012:01. Module (C3) is considered zero, as no further waste processing for reuse, recovery or recycling takes place in this analysis. Module (C4) is the disposal of end-of-life self-levelling compound including physical pre-treatment.

In this case, the landfill is considered the final disposal method.

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, see Table 52. The product itself provide no benefit in module D due to it being send to a landfill at end-of-life. This is because it contains cement products.

Since there is no final packaging of the product, the potential impact in Module D is considered zero.

LCA results

Results for CM Flow casting

Table 6: Environmental impact indicators (CM Flow casting)

ENVIRONMENTAL IMPACTS PER 1 KG									
Indicator	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
GWP- total	kg CO ₂ -eq.	1,47E-01	1,25E-01	1,80E-02	0,00E+00	8,32E-03	0,00E+00	5,28E-03	0,00E+00
GWP-fossil	kg CO ₂ -eq.	1,46E-01	1,24E-01	1,71E-02	0,00E+00	8,31E-03	0,00E+00	5,27E-03	0,00E+00
GWP-biogenic	kg CO ₂ -eq.	1,33E-03	1,27E-04	8,38E-04	0,00E+00	7,08E-06	0,00E+00	5,22E-06	0,00E+00
GWP- luluc	kg CO ₂ -eq.	4,52E-04	7,43E-05	3,53E-05	0,00E+00	3,26E-06	0,00E+00	4,97E-06	0,00E+00
ODP	kg CFC 11 -eq.	1,39E-08	2,71E-08	4,71E-10	0,00E+00	1,92E-09	0,00E+00	2,13E-09	0,00E+00
AP	mol H ⁺ -eq.	7,74E-04	4,85E-04	6,91E-05	0,00E+00	3,37E-05	0,00E+00	4,95E-05	0,00E+00
EP-freshwater	kg P-eq.	2,82E-05	1,16E-05	1,32E-05	0,00E+00	5,35E-07	0,00E+00	4,82E-07	0,00E+00
EP- marine	kg N-eq.	1,72E-04	1,33E-04	1,52E-05	0,00E+00	1,02E-05	0,00E+00	1,72E-05	0,00E+00
EP-terrestrial	mol N-eq.	1,87E-03	1,45E-03	1,68E-04	0,00E+00	1,11E-04	0,00E+00	1,88E-04	0,00E+00
POCP	kg NMVOC -eq.	5,24E-04	4,53E-04	3,84E-05	0,00E+00	3,40E-05	0,00E+00	5,48E-05	0,00E+00
ADP-minerals&metals	kg Sb-eq.	6,03E-07	7,73E-07	2,33E-07	0,00E+00	2,89E-08	0,00E+00	1,20E-08	0,00E+00
ADP-fossil	MJ	1,58E+00	1,85E+00	2,46E-01	0,00E+00	1,26E-01	0,00E+00	1,47E-01	0,00E+00
WDP	m ³	2,07E-03	7,17E-03	9,79E-03	0,00E+00	3,76E-04	0,00E+00	6,62E-03	0,00E+00
Capture	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								
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 7: Additional environmental impact indicators (CM Flow casting)

ADDITIONAL ENVIRONMENTAL IMPACTS PER 1 KG									
Indicator	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
PM	disease inc.	1,13E-08	7,86E-09	4,21E-10	0,00E+00	7,17E-10	0,00E+00	9,97E-10	0,00E+00
IRP	kBq U235 eq	1,37E-02	1,03E-02	4,29E-03	0,00E+00	6,46E-04	0,00E+00	6,53E-04	0,00E+00
ETP-fw	CTUe	2,95E+00	1,62E+00	4,22E-01	0,00E+00	9,81E-02	0,00E+00	9,29E-02	0,00E+00
HTP-c	CTUh	4,71E-11	6,83E-11	9,96E-12	0,00E+00	3,18E-12	0,00E+00	2,36E-12	0,00E+00
HTP-nc	CTUh	1,46E-09	1,61E-09	2,84E-10	0,00E+00	1,03E-10	0,00E+00	6,15E-11	0,00E+00
SQP	Dimensionless	1,80E+00	9,03E-01	2,99E-01	0,00E+00	8,63E-02	0,00E+00	3,09E-01	0,00E+00
Capture	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								

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 experience with the indicator. 2 This impact category deals mainly with the eventual impact of low-dose ionizing radiation on the 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.
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Table 8: Parameters describing resource use (CM Flow casting)

RESOURCE USE PER 1 KG									
Indicator	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
PERE	MJ	1,40E-01	3,93E-02	2,34E-01	0,00E+00	1,77E-03	0,00E+00	1,25E-03	0,00E+00
PERM	MJ	1,24E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PERT	MJ	1,41E-01	3,93E-02	2,34E-01	0,00E+00	1,77E-03	0,00E+00	1,25E-03	0,00E+00
PENRE	MJ	1,61E+00	1,96E+00	3,55E+00	0,00E+00	1,33E-01	0,00E+00	1,56E-01	0,00E+00
PENRM	MJ	7,56E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PENRT	MJ	1,68E+00	1,96E+00	3,55E+00	0,00E+00	1,33E-01	0,00E+00	1,56E-01	0,00E+00
SM	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
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
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
FW	m ³	2,35E-02	7,15E-03	8,94E-03	0,00E+00	3,78E-04	0,00E+00	6,63E-03	0,00E+00
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 freshwater								

Table 9: End-of-life (waste categories and output flows) (CM Flow casting)

WASTE CATEGORIES AND OUTPUT FLOWS PER 1 KG									
Indicator	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
HWD	kg	2,24E-06	5,11E-06	2,78E-07	0,00E+00	3,28E-07	0,00E+00	2,22E-07	0,00E+00
NHWD	kg	3,09E-02	6,06E-02	1,64E-03	0,00E+00	6,46E-03	0,00E+00	1,00E+00	0,00E+00
RWD	kg	7,84E-06	1,22E-05	1,08E-06	0,00E+00	8,50E-07	0,00E+00	9,64E-07	0,00E+00
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
MFR	kg	4,90E-04	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+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
EE	MJ	3,86E-05	2,86E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
EET	MJ	3,70E-04	2,75E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+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; EE = Exported energy, EET = exported thermal energy								

CM Flow casting fiber

Table 10: Environmental impact indicators (CM Flow casting fiber)

ENVIRONMENTAL IMPACTS PER 1 KG									
Indicator	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
GWP- total	kg CO ₂ -eq.	1,48E-01	1,25E-01	1,80E-02	0,00E+00	8,32E-03	0,00E+00	5,28E-03	0,00E+00
GWP-fossil	kg CO ₂ -eq.	1,46E-01	1,24E-01	1,71E-02	0,00E+00	8,31E-03	0,00E+00	5,27E-03	0,00E+00
GWP-biogenic	kg CO ₂ -eq.	1,34E-03	1,27E-04	8,38E-04	0,00E+00	7,08E-06	0,00E+00	5,22E-06	0,00E+00
GWP- luluc	kg CO ₂ -eq.	4,52E-04	7,43E-05	3,53E-05	0,00E+00	3,26E-06	0,00E+00	4,97E-06	0,00E+00
ODP	kg CFC 11 -eq.	1,39E-08	2,71E-08	4,71E-10	0,00E+00	1,92E-09	0,00E+00	2,13E-09	0,00E+00
AP	mol H ⁺ -eq.	7,78E-04	4,85E-04	6,91E-05	0,00E+00	3,37E-05	0,00E+00	4,95E-05	0,00E+00
EP-freshwater	kg P-eq.	2,84E-05	1,16E-05	1,32E-05	0,00E+00	5,35E-07	0,00E+00	4,82E-07	0,00E+00
EP- marine	kg N-eq.	1,73E-04	1,33E-04	1,52E-05	0,00E+00	1,02E-05	0,00E+00	1,72E-05	0,00E+00
EP-terrestrial	mol N-eq.	1,88E-03	1,45E-03	1,68E-04	0,00E+00	1,11E-04	0,00E+00	1,88E-04	0,00E+00
POCP	kg NMVOC -eq.	5,26E-04	4,53E-04	3,84E-05	0,00E+00	3,40E-05	0,00E+00	5,48E-05	0,00E+00
ADP-minerals&metals	kg Sb-eq.	6,10E-07	7,73E-07	2,33E-07	0,00E+00	2,89E-08	0,00E+00	1,20E-08	0,00E+00
ADP-fossil	MJ	1,59E+00	1,85E+00	2,46E-01	0,00E+00	1,26E-01	0,00E+00	1,47E-01	0,00E+00
WDP	m ³	2,40E-02	7,17E-03	9,79E-03	0,00E+00	3,76E-04	0,00E+00	6,62E-03	0,00E+00
Capture	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								
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 11: Additional environmental impact indicators (CM Flow casting fiber)

ADDITIONAL ENVIRONMENTAL IMPACTS PER 1 KG									
Indicator	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
PM	disease inc.	1,13E-08	7,86E-09	4,21E-10	0,00E+00	7,17E-10	0,00E+00	9,97E-10	0,00E+00
IRP	kBq U235 eq	1,38E-02	1,03E-02	4,29E-03	0,00E+00	6,46E-04	0,00E+00	6,53E-04	0,00E+00
ETP-fw	CTUe	2,95E+00	1,62E+00	4,22E-01	0,00E+00	9,81E-02	0,00E+00	9,29E-02	0,00E+00
HTP-c	CTUh	4,71E-11	6,83E-11	9,96E-12	0,00E+00	3,18E-12	0,00E+00	2,36E-12	0,00E+00
HTP-nc	CTUh	1,46E-09	1,61E-09	2,84E-10	0,00E+00	1,03E-10	0,00E+00	6,15E-11	0,00E+00
SQP	Dimensionless	1,80E+00	9,03E-01	2,99E-01	0,00E+00	8,63E-02	0,00E+00	3,09E-01	0,00E+00
Capture	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								

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 experience with the indicator. 2 This impact category deals mainly with the eventual impact of low-dose ionizing radiation on the 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.
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Table 12: Parameters describing resource use (CM Flow casting fiber)

RESOURCE USE PER 1 KG									
Indicator	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
PERE	MJ	1,41E-01	3,93E-02	2,34E-01	0,00E+00	1,77E-03	0,00E+00	1,25E-03	0,00E+00
PERM	MJ	1,24E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PERT	MJ	1,42E-01	3,93E-02	2,34E-01	0,00E+00	1,77E-03	0,00E+00	1,25E-03	0,00E+00
PENRE	MJ	1,62E+00	1,96E+00	3,55E+00	0,00E+00	1,33E-01	0,00E+00	1,56E-01	0,00E+00
PENRM	MJ	7,56E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PENRT	MJ	1,69E+00	1,96E+00	3,55E+00	0,00E+00	1,33E-01	0,00E+00	1,56E-01	0,00E+00
SM	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
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
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
FW	m ³	2,36E-02	7,15E-03	8,96E-03	0,00E+00	3,78E-04	0,00E+00	6,63E-03	0,00E+00
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 freshwater								

Table 13: End-of-life (waste categories and output flows) (CM Flow casting fiber)

WASTE CATEGORIES AND OUTPUT FLOWS PER 1 KG									
Indicator	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
HWD	kg	2,25E-06	5,11E-06	2,77E-07	0,00E+00	3,28E-07	0,00E+00	2,22E-07	0,00E+00
NHWD	kg	3,10E-02	6,06E-02	1,64E-03	0,00E+00	6,46E-03	0,00E+00	1,00E+00	0,00E+00
RWD	kg	7,86E-06	1,22E-05	1,08E-06	0,00E+00	8,50E-07	0,00E+00	9,64E-07	0,00E+00
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
MFR	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
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
EE	MJ	2,86E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
EET	MJ	2,75E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+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; EE = Exported energy, EET = exported thermal energy								

CM Project

Table 14: Environmental impact indicators (CM Project)

ENVIRONMENTAL IMPACTS PER 1 KG									
Indicator	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
GWP- total	kg CO ₂ -eq.	1,93E-01	1,25E-01	1,80E-02	0,00E+00	8,32E-03	0,00E+00	5,28E-03	0,00E+00
GWP-fossil	kg CO ₂ -eq.	1,91E-01	1,24E-01	1,71E-02	0,00E+00	8,31E-03	0,00E+00	5,27E-03	0,00E+00
GWP-biogenic	kg CO ₂ -eq.	1,43E-03	1,27E-04	8,38E-04	0,00E+00	7,08E-06	0,00E+00	5,22E-06	0,00E+00
GWP- luluc	kg CO ₂ -eq.	4,73E-04	7,43E-05	3,53E-05	0,00E+00	3,26E-06	0,00E+00	4,97E-06	0,00E+00
ODP	kg CFC 11 -eq.	1,80E-08	2,71E-08	4,71E-10	0,00E+00	1,92E-09	0,00E+00	2,13E-09	0,00E+00
AP	mol H ⁺ -eq.	9,58E-04	4,85E-04	6,92E-05	0,00E+00	3,37E-05	0,00E+00	4,95E-05	0,00E+00
EP-freshwater	kg P-eq.	3,12E-05	1,16E-05	1,32E-05	0,00E+00	5,35E-07	0,00E+00	4,82E-07	0,00E+00
EP- marine	kg N-eq.	2,13E-04	1,33E-04	1,52E-05	0,00E+00	1,02E-05	0,00E+00	1,72E-05	0,00E+00
EP-terrestrial	mol N-eq.	2,32E-03	1,45E-03	1,68E-04	0,00E+00	1,11E-04	0,00E+00	1,88E-04	0,00E+00
POCP	kg NMVOC -eq.	6,69E-04	4,53E-04	3,84E-05	0,00E+00	3,40E-05	0,00E+00	5,48E-05	0,00E+00
ADP-minerals&metals	kg Sb-eq.	8,25E-07	7,73E-07	2,33E-07	0,00E+00	2,89E-08	0,00E+00	1,20E-08	0,00E+00
ADP-fossil	MJ	2,32E+00	1,85E+00	2,46E-01	0,00E+00	1,26E-01	0,00E+00	1,47E-01	0,00E+00
WDP	m ³	3,81E-02	7,17E-03	1,15E-02	0,00E+00	3,76E-04	0,00E+00	6,62E-03	0,00E+00
Capture	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								
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 15: Additional environmental impact indicators (CM Project)

ADDITIONAL ENVIRONMENTAL IMPACTS PER 1 KG									
Indicator	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
PM	disease inc.	1,03E-08	7,86E-09	4,22E-10	0,00E+00	7,17E-10	0,00E+00	9,97E-10	0,00E+00
IRP	kBq U235 eq	1,44E-02	1,03E-02	4,29E-03	0,00E+00	6,46E-04	0,00E+00	6,53E-04	0,00E+00
ETP-fw	CTUe	3,33E+00	1,62E+00	4,22E-01	0,00E+00	9,81E-02	0,00E+00	9,29E-02	0,00E+00
HTP-c	CTUh	5,14E-11	6,83E-11	9,98E-12	0,00E+00	3,18E-12	0,00E+00	2,36E-12	0,00E+00
HTP-nc	CTUh	1,49E-09	1,61E-09	2,84E-10	0,00E+00	1,03E-10	0,00E+00	6,15E-11	0,00E+00
SQP	Dimensionless	1,97E+00	9,03E-01	2,99E-01	0,00E+00	8,63E-02	0,00E+00	3,09E-01	0,00E+00

Capture	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
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 experience with the indicator. 2 This impact category deals mainly with the eventual impact of low-dose ionizing radiation on the 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 16: Parameters describing resource use (CM Project)

RESOURCE USE PER 1 KG									
Indicator	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
PERE	MJ	1,53E-01	3,93E-02	2,34E-01	0,00E+00	1,77E-03	0,00E+00	1,25E-03	0,00E+00
PERM	MJ	1,89E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PERT	MJ	1,55E-01	3,93E-02	2,34E-01	0,00E+00	1,77E-03	0,00E+00	1,25E-03	0,00E+00
PENRE	MJ	2,15E+00	1,96E+00	3,55E+00	0,00E+00	1,33E-01	0,00E+00	1,56E-01	0,00E+00
PENRM	MJ	3,22E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PENRT	MJ	2,48E+00	1,96E+00	3,55E+00	0,00E+00	1,33E-01	0,00E+00	1,56E-01	0,00E+00
SM	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
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
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
FW	m ³	3,72E-02	7,15E-03	1,06E-02	0,00E+00	3,78E-04	0,00E+00	6,63E-03	0,00E+00
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 freshwater								

Table 17: End-of-life (waste categories and output flows) (CM Project)

WASTE CATEGORIES AND OUTPUT FLOWS PER 1 KG									
Indicator	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
HWD	kg	2,76E-06	5,11E-06	2,77E-07	0,00E+00	3,28E-07	0,00E+00	2,22E-07	0,00E+00
NHWD	kg	3,84E-02	6,06E-02	1,64E-03	0,00E+00	6,46E-03	0,00E+00	1,00E+00	0,00E+00
RWD	kg	9,26E-06	1,22E-05	1,08E-06	0,00E+00	8,50E-07	0,00E+00	9,64E-07	0,00E+00
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
MFR	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
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
EE	MJ	3,60E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
EET	MJ	3,45E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+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; EE = Exported energy, EET = exported thermal energy
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CM Project fiber

Table 18: Environmental impact indicators (CM Project fiber)

ENVIRONMENTAL IMPACTS PER 1 KG									
Indicator	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
GWP- total	kg CO ₂ -eq.	1,94E-01	1,25E-01	1,80E-02	0,00E+00	8,32E-03	0,00E+00	5,28E-03	0,00E+00
GWP-fossil	kg CO ₂ -eq.	1,92E-01	1,24E-01	1,71E-02	0,00E+00	8,31E-03	0,00E+00	5,27E-03	0,00E+00
GWP-biogenic	kg CO ₂ -eq.	1,43E-03	1,27E-04	8,38E-04	0,00E+00	7,08E-06	0,00E+00	5,22E-06	0,00E+00
GWP- luluc	kg CO ₂ -eq.	4,73E-04	7,43E-05	3,53E-05	0,00E+00	3,26E-06	0,00E+00	4,97E-06	0,00E+00
ODP	kg CFC 11 -eq.	1,80E-08	2,71E-08	4,71E-10	0,00E+00	1,92E-09	0,00E+00	2,13E-09	0,00E+00
AP	mol H ⁺ -eq.	9,61E-04	4,85E-04	6,92E-05	0,00E+00	3,37E-05	0,00E+00	4,95E-05	0,00E+00
EP-freshwater	kg P-eq.	3,14E-05	1,16E-05	1,32E-05	0,00E+00	5,35E-07	0,00E+00	4,82E-07	0,00E+00
EP- marine	kg N-eq.	2,14E-04	1,33E-04	1,52E-05	0,00E+00	1,02E-05	0,00E+00	1,72E-05	0,00E+00
EP-terrestrial	mol N-eq.	2,33E-03	1,45E-03	1,68E-04	0,00E+00	1,11E-04	0,00E+00	1,88E-04	0,00E+00
POCP	kg NMVOC -eq.	6,71E-04	4,53E-04	3,84E-05	0,00E+00	3,40E-05	0,00E+00	5,48E-05	0,00E+00
ADP-minerals&metals	kg Sb-eq.	8,32E-07	7,73E-07	2,33E-07	0,00E+00	2,89E-08	0,00E+00	1,20E-08	0,00E+00
ADP-fossil	MJ	2,33E+00	1,85E+00	2,46E-01	0,00E+00	1,26E-01	0,00E+00	1,47E-01	0,00E+00
WDP	m ³	3,82E-02	7,17E-03	1,15E-02	0,00E+00	3,76E-04	0,00E+00	6,62E-03	0,00E+00
Capture	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								
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 19: Additional environmental impact indicators (CM Project fiber)

ADDITIONAL ENVIRONMENTAL IMPACTS PER 1 KG									
Indicator	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
PM	disease inc.	1,04E-08	7,86E-09	4,22E-10	0,00E+00	7,17E-10	0,00E+00	9,97E-10	0,00E+00
IRP	kBq U235 eq	1,45E-02	1,03E-02	4,29E-03	0,00E+00	6,46E-04	0,00E+00	6,53E-04	0,00E+00
ETP-fw	CTUe	3,34E+00	1,62E+00	4,22E-01	0,00E+00	9,81E-02	0,00E+00	9,29E-02	0,00E+00
HTP-c	CTUh	5,14E-11	6,83E-11	9,98E-12	0,00E+00	3,18E-12	0,00E+00	2,36E-12	0,00E+00

HTP-nc	CTUh	1,49E-09	1,61E-09	2,84E-10	0,00E+00	1,03E-10	0,00E+00	6,15E-11	0,00E+00
SQP	Dimensionless	1,97E+00	9,03E-01	2,99E-01	0,00E+00	8,63E-02	0,00E+00	3,09E-01	0,00E+00
Capture	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								
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 experience with the indicator. 2 This impact category deals mainly with the eventual impact of low-dose ionizing radiation on the 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 (CM Project fiber)

RESOURCE USE PER 1 KG									
Indicator	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
PERE	MJ	1,53E-01	3,93E-02	2,34E-01	0,00E+00	1,77E-03	0,00E+00	1,25E-03	0,00E+00
PERM	MJ	2,37E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PERT	MJ	1,55E-01	3,93E-02	2,34E-01	0,00E+00	1,77E-03	0,00E+00	1,25E-03	0,00E+00
PENRE	MJ	2,16E+00	1,96E+00	3,55E+00	0,00E+00	1,33E-01	0,00E+00	1,56E-01	0,00E+00
PENRM	MJ	3,22E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PENRT	MJ	2,48E+00	1,96E+00	3,55E+00	0,00E+00	1,33E-01	0,00E+00	1,56E-01	0,00E+00
SM	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
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
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
FW	m ³	3,73E-02	7,15E-03	1,06E-02	0,00E+00	3,78E-04	0,00E+00	6,63E-03	0,00E+00
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 freshwater								

Table 21: End-of-life (waste categories and output flows) (CM Project fiber)

WASTE CATEGORIES AND OUTPUT FLOWS PER 1 KG									
Indicator	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
HWD	kg	2,76E-06	5,11E-06	2,77E-07	0,00E+00	3,28E-07	0,00E+00	2,22E-07	0,00E+00
NHWD	kg	3,84E-02	6,06E-02	1,64E-03	0,00E+00	6,46E-03	0,00E+00	1,00E+00	0,00E+00
RWD	kg	9,28E-06	1,22E-05	1,08E-06	0,00E+00	8,50E-07	0,00E+00	9,64E-07	0,00E+00
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
MFR	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
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
EE	MJ	3,60E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00

EET	MJ	3,46E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+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; EE = Exported energy, EET = exported thermal energy								

CM Project Selfdrying

Table 22: Environmental impact indicators (CM Project selfdrying)

ENVIRONMENTAL IMPACTS PER 1 KG									
Indicator	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
GWP- total	kg CO ₂ -eq.	2,30E-01	1,25E-01	1,80E-02	0,00E+00	8,32E-03	0,00E+00	5,28E-03	0,00E+00
GWP-fossil	kg CO ₂ -eq.	2,28E-01	1,24E-01	1,71E-02	0,00E+00	8,31E-03	0,00E+00	5,27E-03	0,00E+00
GWP-biogenic	kg CO ₂ -eq.	1,50E-03	1,27E-04	8,38E-04	0,00E+00	7,08E-06	0,00E+00	5,22E-06	0,00E+00
GWP- luluc	kg CO ₂ -eq.	4,82E-04	7,43E-05	3,53E-05	0,00E+00	3,26E-06	0,00E+00	4,97E-06	0,00E+00
ODP	kg CFC 11 -eq.	1,93E-08	2,71E-08	4,71E-10	0,00E+00	1,92E-09	0,00E+00	2,13E-09	0,00E+00
AP	mol H ⁺ -eq.	1,09E-03	4,85E-04	6,91E-05	0,00E+00	3,37E-05	0,00E+00	4,95E-05	0,00E+00
EP-freshwater	kg P-eq.	3,40E-05	1,16E-05	1,32E-05	0,00E+00	5,35E-07	0,00E+00	4,82E-07	0,00E+00
EP- marine	kg N-eq.	2,48E-04	1,33E-04	1,52E-05	0,00E+00	1,02E-05	0,00E+00	1,72E-05	0,00E+00
EP-terrestrial	mol N-eq.	2,71E-03	1,45E-03	1,68E-04	0,00E+00	1,11E-04	0,00E+00	1,88E-04	0,00E+00
POCP	kg NMVOC -eq.	7,94E-04	4,53E-04	3,84E-05	0,00E+00	3,40E-05	0,00E+00	5,48E-05	0,00E+00
ADP-minerals&metals	kg Sb-eq.	9,84E-07	7,73E-07	2,33E-07	0,00E+00	2,89E-08	0,00E+00	1,20E-08	0,00E+00
ADP-fossil	MJ	3,06E+00	1,85E+00	2,46E-01	0,00E+00	1,26E-01	0,00E+00	1,47E-01	0,00E+00
WDP	m ³	5,28E-02	7,17E-03	1,02E-02	0,00E+00	3,76E-04	0,00E+00	6,62E-03	0,00E+00
Capture	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								
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 23: Additional environmental impact indicators (CM Project selfdrying)

ADDITIONAL ENVIRONMENTAL IMPACTS PER 1 KG									
Indicator	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
PM	disease inc.	1,12E-08	7,86E-09	4,21E-10	0,00E+00	7,17E-10	0,00E+00	9,97E-10	0,00E+00
IRP	kBq U235 eq	1,53E-02	1,03E-02	4,29E-03	0,00E+00	6,46E-04	0,00E+00	6,53E-04	0,00E+00

ETP-fw	CTUe	3,35E+00	1,62E+00	4,22E-01	0,00E+00	9,81E-02	0,00E+00	9,29E-02	0,00E+00
HTP-c	CTUh	5,33E-11	6,83E-11	9,96E-12	0,00E+00	3,18E-12	0,00E+00	2,36E-12	0,00E+00
HTP-nc	CTUh	1,52E-09	1,61E-09	2,84E-10	0,00E+00	1,03E-10	0,00E+00	6,15E-11	0,00E+00
SQP	Dimensionless	2,08E+00	9,03E-01	2,99E-01	0,00E+00	8,63E-02	0,00E+00	3,09E-01	0,00E+00
Capture	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								
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 experience with the indicator. 2 This impact category deals mainly with the eventual impact of low-dose ionizing radiation on the 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 24: Parameters describing resource use (CM Project selfdrying)

RESOURCE USE PER 1 KG									
Indicator	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
PERE	MJ	1,63E-01	3,93E-02	2,34E-01	0,00E+00	1,77E-03	0,00E+00	1,25E-03	0,00E+00
PERM	MJ	1,89E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PERT	MJ	1,65E-01	3,93E-02	2,34E-01	0,00E+00	1,77E-03	0,00E+00	1,25E-03	0,00E+00
PENRE	MJ	2,61E+00	1,96E+00	3,55E+00	0,00E+00	1,33E-01	0,00E+00	1,56E-01	0,00E+00
PENRM	MJ	6,65E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PENRT	MJ	3,27E+00	1,96E+00	3,55E+00	0,00E+00	1,33E-01	0,00E+00	1,56E-01	0,00E+00
SM	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
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
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
FW	m ³	5,14E-02	7,15E-03	9,37E-03	0,00E+00	3,78E-04	0,00E+00	6,63E-03	0,00E+00
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 freshwater								

Table 25: End-of-life (waste categories and output flows) (CM Project selfdrying)

WASTE CATEGORIES AND OUTPUT FLOWS PER 1 KG									
Indicator	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
HWD	kg	2,88E-06	5,11E-06	2,77E-07	0,00E+00	3,28E-07	0,00E+00	2,22E-07	0,00E+00
NHWD	kg	3,97E-02	6,06E-02	1,64E-03	0,00E+00	6,46E-03	0,00E+00	1,00E+00	0,00E+00
RWD	kg	1,00E-05	1,22E-05	1,08E-06	0,00E+00	8,50E-07	0,00E+00	9,64E-07	0,00E+00
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
MFR	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

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
EE	MJ	4,45E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
EET	MJ	4,28E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+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; EE = Exported energy, EET = exported thermal energy								

CM 720 Fine

Table 26: Environmental impact indicators (CM 720 Fine)

ENVIRONMENTAL IMPACTS PER 1 KG									
Indicator	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
GWP- total	kg CO ₂ -eq.	2,05E-01	1,25E-01	1,80E-02	0,00E+00	8,32E-03	0,00E+00	5,28E-03	0,00E+00
GWP-fossil	kg CO ₂ -eq.	2,03E-01	1,24E-01	1,71E-02	0,00E+00	8,31E-03	0,00E+00	5,27E-03	0,00E+00
GWP-biogenic	kg CO ₂ -eq.	1,41E-03	1,27E-04	8,38E-04	0,00E+00	7,08E-06	0,00E+00	5,22E-06	0,00E+00
GWP- luluc	kg CO ₂ -eq.	4,52E-04	7,43E-05	3,53E-05	0,00E+00	3,26E-06	0,00E+00	4,97E-06	0,00E+00
ODP	kg CFC 11 -eq.	1,92E-08	2,71E-08	4,71E-10	0,00E+00	1,92E-09	0,00E+00	2,13E-09	0,00E+00
AP	mol H ⁺ -eq.	1,02E-03	4,85E-04	6,92E-05	0,00E+00	3,37E-05	0,00E+00	4,95E-05	0,00E+00
EP-freshwater	kg P-eq.	3,28E-05	1,16E-05	1,32E-05	0,00E+00	5,35E-07	0,00E+00	4,82E-07	0,00E+00
EP- marine	kg N-eq.	2,27E-04	1,33E-04	1,52E-05	0,00E+00	1,02E-05	0,00E+00	1,72E-05	0,00E+00
EP-terrestrial	mol N-eq.	2,48E-03	1,45E-03	1,68E-04	0,00E+00	1,11E-04	0,00E+00	1,88E-04	0,00E+00
POCP	kg NMVOC-eq.	7,15E-04	4,53E-04	3,84E-05	0,00E+00	3,40E-05	0,00E+00	5,48E-05	0,00E+00
ADP-minerals&metals	kg Sb-eq.	8,86E-07	7,73E-07	2,33E-07	0,00E+00	2,89E-08	0,00E+00	1,20E-08	0,00E+00
ADP-fossil	MJ	2,51E+00	1,85E+00	2,46E-01	0,00E+00	1,26E-01	0,00E+00	1,47E-01	0,00E+00
WDP	m ³	4,09E-02	7,17E-03	1,15E-02	0,00E+00	3,76E-04	0,00E+00	6,62E-03	0,00E+00
Capture	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								
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 27: Additional environmental impact indicators (CM 720 Fine)

ADDITIONAL ENVIRONMENTAL IMPACTS PER 1 KG									
Indicator	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D

PM	disease inc.	1,08E-08	7,86E-09	4,22E-10	0,00E+00	7,17E-10	0,00E+00	9,97E-10	0,00E+00
IRP	kBq U235 eq	1,53E-02	1,03E-02	4,29E-03	0,00E+00	6,46E-04	0,00E+00	6,53E-04	0,00E+00
ETP-fw	CTUe	3,51E+00	1,62E+00	4,22E-01	0,00E+00	9,81E-02	0,00E+00	9,29E-02	0,00E+00
HTP-c	CTUh	5,23E-11	6,83E-11	9,98E-12	0,00E+00	3,18E-12	0,00E+00	2,36E-12	0,00E+00
HTP-nc	CTUh	1,50E-09	1,61E-09	2,84E-10	0,00E+00	1,03E-10	0,00E+00	6,15E-11	0,00E+00
SQP	Dimensionless	1,93E+00	9,03E-01	2,99E-01	0,00E+00	8,63E-02	0,00E+00	3,09E-01	0,00E+00
Capture	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								
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 experience with the indicator. 2 This impact category deals mainly with the eventual impact of low-dose ionizing radiation on the 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 28: Parameters describing resource use (CM 720 Fine)

RESOURCE USE PER 1 KG									
Indicator	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
PERE	MJ	1,60E-01	3,93E-02	2,34E-01	0,00E+00	1,77E-03	0,00E+00	1,25E-03	0,00E+00
PERM	MJ	1,89E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PERT	MJ	1,62E-01	3,93E-02	2,34E-01	0,00E+00	1,77E-03	0,00E+00	1,25E-03	0,00E+00
PENRE	MJ	2,31E+00	1,96E+00	3,55E+00	0,00E+00	1,33E-01	0,00E+00	1,56E-01	0,00E+00
PENRM	MJ	3,72E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PENRT	MJ	2,68E+00	1,96E+00	3,55E+00	0,00E+00	1,33E-01	0,00E+00	1,56E-01	0,00E+00
SM	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
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
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
FW	m ³	3,99E-02	7,15E-03	1,06E-02	0,00E+00	3,78E-04	0,00E+00	6,63E-03	0,00E+00
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 freshwater								

Table 29: End-of-life (waste categories and output flows) (CM 720 Fine)

WASTE CATEGORIES AND OUTPUT FLOWS PER 1 KG									
Indicator	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
HWD	kg	2,93E-06	5,11E-06	2,77E-07	0,00E+00	3,28E-07	0,00E+00	2,22E-07	0,00E+00
NHWD	kg	4,10E-02	6,06E-02	1,64E-03	0,00E+00	6,46E-03	0,00E+00	1,00E+00	0,00E+00
RWD	kg	9,89E-06	1,22E-05	1,08E-06	0,00E+00	8,50E-07	0,00E+00	9,64E-07	0,00E+00

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
MFR	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
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
EE	MJ	4,10E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
EET	MJ	3,93E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+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; EE = Exported energy, EET = exported thermal energy								

CM 750 S

Table 30: Environmental impact indicators (CM 750 S)

ENVIRONMENTAL IMPACTS PER 1 KG									
Indicator	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
GWP- total	kg CO ₂ -eq.	2,83E-01	1,25E-01	1,80E-02	0,00E+00	8,32E-03	0,00E+00	5,28E-03	0,00E+00
GWP-fossil	kg CO ₂ -eq.	2,81E-01	1,24E-01	1,71E-02	0,00E+00	8,31E-03	0,00E+00	5,27E-03	0,00E+00
GWP-biogenic	kg CO ₂ -eq.	1,74E-03	1,27E-04	8,39E-04	0,00E+00	7,08E-06	0,00E+00	5,22E-06	0,00E+00
GWP- luluc	kg CO ₂ -eq.	3,31E-04	7,43E-05	3,53E-05	0,00E+00	3,26E-06	0,00E+00	4,97E-06	0,00E+00
ODP	kg CFC 11 -eq.	2,51E-08	2,71E-08	4,72E-10	0,00E+00	1,92E-09	0,00E+00	2,13E-09	0,00E+00
AP	mol H ⁺ -eq.	1,33E-03	4,85E-04	6,93E-05	0,00E+00	3,37E-05	0,00E+00	4,95E-05	0,00E+00
EP-freshwater	kg P-eq.	5,04E-05	1,16E-05	1,32E-05	0,00E+00	5,35E-07	0,00E+00	4,82E-07	0,00E+00
EP- marine	kg N-eq.	2,89E-04	1,33E-04	1,52E-05	0,00E+00	1,02E-05	0,00E+00	1,72E-05	0,00E+00
EP-terrestrial	mol N-eq.	3,16E-03	1,45E-03	1,68E-04	0,00E+00	1,11E-04	0,00E+00	1,88E-04	0,00E+00
POCP	kg NMVOC -eq.	9,44E-04	4,53E-04	3,85E-05	0,00E+00	3,40E-05	0,00E+00	5,48E-05	0,00E+00
ADP-minerals&metals	kg Sb-eq.	1,44E-06	7,73E-07	2,33E-07	0,00E+00	2,89E-08	0,00E+00	1,20E-08	0,00E+00
ADP-fossil	MJ	4,25E+00	1,85E+00	2,46E-01	0,00E+00	1,26E-01	0,00E+00	1,47E-01	0,00E+00
WDP	m ³	7,79E-02	7,17E-03	1,32E-02	0,00E+00	3,76E-04	0,00E+00	6,62E-03	0,00E+00
Capture	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								
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 31: Additional environmental impact indicators (CM 750 S)

ADDITIONAL ENVIRONMENTAL IMPACTS PER 1 KG									
Indicator	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
PM	disease inc.	1,72E-08	7,86E-09	4,22E-10	0,00E+00	7,17E-10	0,00E+00	9,97E-10	0,00E+00
IRP	kBq U235 eq	2,52E-02	1,03E-02	4,30E-03	0,00E+00	6,46E-04	0,00E+00	6,53E-04	0,00E+00
ETP-fw	CTUe	4,62E+00	1,62E+00	4,23E-01	0,00E+00	9,81E-02	0,00E+00	9,29E-02	0,00E+00
HTP-c	CTUh	5,85E-11	6,83E-11	9,99E-12	0,00E+00	3,18E-12	0,00E+00	2,36E-12	0,00E+00
HTP-nc	CTUh	1,55E-09	1,61E-09	2,84E-10	0,00E+00	1,03E-10	0,00E+00	6,15E-11	0,00E+00
SQP	Dimensionless	1,55E+00	9,03E-01	2,99E-01	0,00E+00	8,63E-02	0,00E+00	3,09E-01	0,00E+00
Capture	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								
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 experience with the indicator. 2 This impact category deals mainly with the eventual impact of low-dose ionizing radiation on the 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 32: Parameters describing resource use (CM 750 S)

RESOURCE USE PER 1 KG									
Indicator	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
PERE	MJ	2,35E-01	3,93E-02	2,34E-01	0,00E+00	1,77E-03	0,00E+00	1,25E-03	0,00E+00
PERM	MJ	2,16E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PERT	MJ	2,37E-01	3,93E-02	2,34E-01	0,00E+00	1,77E-03	0,00E+00	1,25E-03	0,00E+00
PENRE	MJ	3,56E+00	1,96E+00	3,55E+00	0,00E+00	1,33E-01	0,00E+00	1,56E-01	0,00E+00
PENRM	MJ	9,92E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PENRT	MJ	4,55E+00	1,96E+00	3,55E+00	0,00E+00	1,33E-01	0,00E+00	1,56E-01	0,00E+00
SM	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
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
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
FW	m ³	7,58E-02	7,15E-03	1,22E-02	0,00E+00	3,78E-04	0,00E+00	6,63E-03	0,00E+00
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 freshwater								

Table 33: End-of-life (waste categories and output flows) (CM 750 S)

WASTE CATEGORIES AND OUTPUT FLOWS PER 1 KG									
Indicator	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
HWD	kg	3,66E-06	5,11E-06	2,78E-07	0,00E+00	3,28E-07	0,00E+00	2,22E-07	0,00E+00

NHWD	kg	4,80E-02	6,06E-02	1,64E-03	0,00E+00	6,46E-03	0,00E+00	1,00E+00	0,00E+00
RWD	kg	1,36E-05	1,22E-05	1,08E-06	0,00E+00	8,50E-07	0,00E+00	9,64E-07	0,00E+00
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
MFR	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
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
EE	MJ	5,36E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
EET	MJ	5,15E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+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; EE = Exported energy, EET = exported thermal energy								

CM 760 Fiber

Table 34: Environmental impact indicators (CM 760 Fiber)

ENVIRONMENTAL IMPACTS PER 1 KG									
Indicator	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
GWP- total	kg CO ₂ -eq.	2,30E-01	1,25E-01	1,80E-02	0,00E+00	8,32E-03	0,00E+00	5,28E-03	0,00E+00
GWP-fossil	kg CO ₂ -eq.	2,29E-01	1,24E-01	1,71E-02	0,00E+00	8,31E-03	0,00E+00	5,27E-03	0,00E+00
GWP-biogenic	kg CO ₂ -eq.	1,35E-03	1,27E-04	8,38E-04	0,00E+00	7,08E-06	0,00E+00	5,22E-06	0,00E+00
GWP- luluc	kg CO ₂ -eq.	4,83E-04	7,43E-05	3,53E-05	0,00E+00	3,26E-06	0,00E+00	4,97E-06	0,00E+00
ODP	kg CFC 11 -eq.	1,94E-08	2,71E-08	4,71E-10	0,00E+00	1,92E-09	0,00E+00	2,13E-09	0,00E+00
AP	mol H ⁺ -eq.	1,09E-03	4,85E-04	6,92E-05	0,00E+00	3,37E-05	0,00E+00	4,95E-05	0,00E+00
EP-freshwater	kg P-eq.	3,42E-05	1,16E-05	1,32E-05	0,00E+00	5,35E-07	0,00E+00	4,82E-07	0,00E+00
EP- marine	kg N-eq.	2,49E-04	1,33E-04	1,52E-05	0,00E+00	1,02E-05	0,00E+00	1,72E-05	0,00E+00
EP-terrestrial	mol N-eq.	2,72E-03	1,45E-03	1,68E-04	0,00E+00	1,11E-04	0,00E+00	1,88E-04	0,00E+00
POCP	kg NMVOC -eq.	7,96E-04	4,53E-04	3,84E-05	0,00E+00	3,40E-05	0,00E+00	5,48E-05	0,00E+00
ADP-minerals&metals	kg Sb-eq.	9,91E-07	7,73E-07	2,33E-07	0,00E+00	2,89E-08	0,00E+00	1,20E-08	0,00E+00
ADP-fossil	MJ	3,07E+00	1,85E+00	2,46E-01	0,00E+00	1,26E-01	0,00E+00	1,47E-01	0,00E+00
WDP	m ³	5,30E-02	7,17E-03	1,07E-02	0,00E+00	3,76E-04	0,00E+00	6,62E-03	0,00E+00
Capture	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								

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.
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Table 35: Additional environmental impact indicators (CM 760 Fiber)

ADDITIONAL ENVIRONMENTAL IMPACTS PER 1 KG									
Indicator	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
PM	disease inc.	1,12E-08	7,86E-09	4,21E-10	0,00E+00	7,17E-10	0,00E+00	9,97E-10	0,00E+00
IRP	kBq U235 eq	1,54E-02	1,03E-02	4,29E-03	0,00E+00	6,46E-04	0,00E+00	6,53E-04	0,00E+00
ETP-fw	CTUe	3,36E+00	1,62E+00	4,22E-01	0,00E+00	9,81E-02	0,00E+00	9,29E-02	0,00E+00
HTP-c	CTUh	5,34E-11	6,83E-11	9,97E-12	0,00E+00	3,18E-12	0,00E+00	2,36E-12	0,00E+00
HTP-nc	CTUh	1,52E-09	1,61E-09	2,84E-10	0,00E+00	1,03E-10	0,00E+00	6,15E-11	0,00E+00
SQP	Dimensionless	2,10E+00	9,03E-01	2,99E-01	0,00E+00	8,63E-02	0,00E+00	3,09E-01	0,00E+00
Capture	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								
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 experience with the indicator. 2 This impact category deals mainly with the eventual impact of low-dose ionizing radiation on the 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 36: Parameters describing resource use (CM 760 Fiber)

RESOURCE USE PER 1 KG									
Indicator	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
PERE	MJ	1,68E-01	3,93E-02	2,34E-01	0,00E+00	1,77E-03	0,00E+00	1,25E-03	0,00E+00
PERM	MJ	2,02E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PERT	MJ	1,70E-01	3,93E-02	2,34E-01	0,00E+00	1,77E-03	0,00E+00	1,25E-03	0,00E+00
PENRE	MJ	2,62E+00	1,96E+00	3,55E+00	0,00E+00	1,33E-01	0,00E+00	1,56E-01	0,00E+00
PENRM	MJ	6,62E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PENRT	MJ	3,28E+00	1,96E+00	3,55E+00	0,00E+00	1,33E-01	0,00E+00	1,56E-01	0,00E+00
SM	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
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
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
FW	m ³	5,15E-02	7,15E-03	9,78E-03	0,00E+00	3,78E-04	0,00E+00	6,63E-03	0,00E+00
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 freshwater								

Table 37: End-of-life (waste categories and output flows) (CM 760 Fiber)

WASTE CATEGORIES AND OUTPUT FLOWS PER 1 KG
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Indicator	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
HWD	kg	2,89E-06	5,11E-06	2,77E-07	0,00E+00	3,28E-07	0,00E+00	2,22E-07	0,00E+00
NHWD	kg	3,98E-02	6,06E-02	1,64E-03	0,00E+00	6,46E-03	0,00E+00	1,00E+00	0,00E+00
RWD	kg	1,00E-05	1,22E-05	1,08E-06	0,00E+00	8,50E-07	0,00E+00	9,64E-07	0,00E+00
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
MFR	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
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
EE	MJ	5,22E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
EET	MJ	5,01E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+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; EE = Exported energy, EET = exported thermal energy								

CM 920 Industrial

Table 38: Environmental impact indicators (CM 920 Industrial)

ENVIRONMENTAL IMPACTS PER 1 KG									
Indicator	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
GWP- total	kg CO ₂ -eq.	2,66E-01	1,25E-01	1,80E-02	0,00E+00	8,32E-03	0,00E+00	5,28E-03	0,00E+00
GWP-fossil	kg CO ₂ -eq.	2,63E-01	1,24E-01	1,71E-02	0,00E+00	8,31E-03	0,00E+00	5,27E-03	0,00E+00
GWP-biogenic	kg CO ₂ -eq.	2,22E-03	1,27E-04	8,38E-04	0,00E+00	7,08E-06	0,00E+00	5,22E-06	0,00E+00
GWP- luluc	kg CO ₂ -eq.	4,90E-04	7,43E-05	3,53E-05	0,00E+00	3,26E-06	0,00E+00	4,97E-06	0,00E+00
ODP	kg CFC 11 -eq.	2,15E-08	2,71E-08	4,71E-10	0,00E+00	1,92E-09	0,00E+00	2,13E-09	0,00E+00
AP	mol H ⁺ -eq.	1,21E-03	4,85E-04	6,92E-05	0,00E+00	3,37E-05	0,00E+00	4,95E-05	0,00E+00
EP-freshwater	kg P-eq.	3,92E-05	1,16E-05	1,32E-05	0,00E+00	5,35E-07	0,00E+00	4,82E-07	0,00E+00
EP- marine	kg N-eq.	2,73E-04	1,33E-04	1,52E-05	0,00E+00	1,02E-05	0,00E+00	1,72E-05	0,00E+00
EP-terrestrial	mol N-eq.	2,98E-03	1,45E-03	1,68E-04	0,00E+00	1,11E-04	0,00E+00	1,88E-04	0,00E+00
POCP	kg NMVOC -eq.	9,06E-04	4,53E-04	3,84E-05	0,00E+00	3,40E-05	0,00E+00	5,48E-05	0,00E+00
ADP-minerals&metals	kg Sb-eq.	1,27E-06	7,73E-07	2,33E-07	0,00E+00	2,89E-08	0,00E+00	1,20E-08	0,00E+00
ADP-fossil	MJ	4,16E+00	1,85E+00	2,46E-01	0,00E+00	1,26E-01	0,00E+00	1,47E-01	0,00E+00
WDP	m ³	7,52E-02	7,17E-03	1,07E-02	0,00E+00	3,76E-04	0,00E+00	6,62E-03	0,00E+00
Capture	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
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 39: Additional environmental impact indicators (CM 920 Industrial)

ADDITIONAL ENVIRONMENTAL IMPACTS PER 1 KG									
Indicator	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
PM	disease inc.	1,24E-08	7,86E-09	4,21E-10	0,00E+00	7,17E-10	0,00E+00	9,97E-10	0,00E+00
IRP	kBq U235 eq	1,76E-02	1,03E-02	4,29E-03	0,00E+00	6,46E-04	0,00E+00	6,53E-04	0,00E+00
ETP-fw	CTUe	3,66E+00	1,62E+00	4,22E-01	0,00E+00	9,81E-02	0,00E+00	9,29E-02	0,00E+00
HTP-c	CTUh	5,56E-11	6,83E-11	9,97E-12	0,00E+00	3,18E-12	0,00E+00	2,36E-12	0,00E+00
HTP-nc	CTUh	1,56E-09	1,61E-09	2,84E-10	0,00E+00	1,03E-10	0,00E+00	6,15E-11	0,00E+00
SQP	Dimensionless	2,13E+00	9,03E-01	2,99E-01	0,00E+00	8,63E-02	0,00E+00	3,09E-01	0,00E+00
Capture	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								
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 experience with the indicator. 2 This impact category deals mainly with the eventual impact of low-dose ionizing radiation on the 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 40: Parameters describing resource use (CM 920 Industrial)

RESOURCE USE PER 1 KG									
Indicator	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
PERE	MJ	1,84E-01	3,93E-02	2,34E-01	0,00E+00	1,77E-03	0,00E+00	1,25E-03	0,00E+00
PERM	MJ	1,89E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PERT	MJ	1,86E-01	3,93E-02	2,34E-01	0,00E+00	1,77E-03	0,00E+00	1,25E-03	0,00E+00
PENRE	MJ	3,30E+00	1,96E+00	3,55E+00	0,00E+00	1,33E-01	0,00E+00	1,56E-01	0,00E+00
PENRM	MJ	1,15E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PENRT	MJ	4,45E+00	1,96E+00	3,55E+00	0,00E+00	1,33E-01	0,00E+00	1,56E-01	0,00E+00
SM	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
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
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
FW	m ³	7,30E-02	7,15E-03	9,78E-03	0,00E+00	3,78E-04	0,00E+00	6,63E-03	0,00E+00
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 freshwater								

Table 41: End-of-life (waste categories and output flows) (CM 920 Industrial)

WASTE CATEGORIES AND OUTPUT FLOWS PER 1 KG									
Indicator	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
HWD	kg	3,21E-06	5,11E-06	2,77E-07	0,00E+00	3,28E-07	0,00E+00	2,22E-07	0,00E+00
NHWD	kg	4,34E-02	6,06E-02	1,64E-03	0,00E+00	6,46E-03	0,00E+00	1,00E+00	0,00E+00
RWD	kg	1,11E-05	1,22E-05	1,08E-06	0,00E+00	8,50E-07	0,00E+00	9,64E-07	0,00E+00
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
MFR	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
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
EE	MJ	4,45E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
EET	MJ	4,28E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+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; EE = Exported energy, EET = exported thermal energy								

CM 940 Industrial Top

Table 42: Environmental impact indicators (CM 940 Industrial Top)

ENVIRONMENTAL IMPACTS PER 1 KG									
Indicator	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
GWP- total	kg CO ₂ -eq.	3,37E-01	1,25E-01	1,80E-02	0,00E+00	8,32E-03	0,00E+00	5,28E-03	0,00E+00
GWP-fossil	kg CO ₂ -eq.	3,36E-01	1,24E-01	1,71E-02	0,00E+00	8,31E-03	0,00E+00	5,27E-03	0,00E+00
GWP-biogenic	kg CO ₂ -eq.	3,26E-04	1,27E-04	8,38E-04	0,00E+00	7,08E-06	0,00E+00	5,22E-06	0,00E+00
GWP- luluc	kg CO ₂ -eq.	4,53E-04	7,43E-05	3,53E-05	0,00E+00	3,26E-06	0,00E+00	4,97E-06	0,00E+00
ODP	kg CFC 11 -eq.	2,94E-08	2,71E-08	4,71E-10	0,00E+00	1,92E-09	0,00E+00	2,13E-09	0,00E+00
AP	mol H ⁺ -eq.	1,53E-03	4,85E-04	6,92E-05	0,00E+00	3,37E-05	0,00E+00	4,95E-05	0,00E+00
EP-freshwater	kg P-eq.	4,94E-05	1,16E-05	1,32E-05	0,00E+00	5,35E-07	0,00E+00	4,82E-07	0,00E+00
EP- marine	kg N-eq.	3,41E-04	1,33E-04	1,52E-05	0,00E+00	1,02E-05	0,00E+00	1,72E-05	0,00E+00
EP-terrestrial	mol N-eq.	3,72E-03	1,45E-03	1,68E-04	0,00E+00	1,11E-04	0,00E+00	1,88E-04	0,00E+00
POCP	kg NMVOC-eq.	1,15E-03	4,53E-04	3,84E-05	0,00E+00	3,40E-05	0,00E+00	5,48E-05	0,00E+00
ADP-minerals&metals	kg Sb-eq.	1,73E-06	7,73E-07	2,33E-07	0,00E+00	2,89E-08	0,00E+00	1,20E-08	0,00E+00
ADP-fossil	MJ	5,64E+00	1,85E+00	2,46E-01	0,00E+00	1,26E-01	0,00E+00	1,47E-01	0,00E+00
WDP	m ³	1,06E-01	7,17E-03	1,15E-02	0,00E+00	3,76E-04	0,00E+00	6,62E-03	0,00E+00

Capture	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
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 43: Additional environmental impact indicators (CM 940 Industrial Top)

ADDITIONAL ENVIRONMENTAL IMPACTS PER 1 KG									
Indicator	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
PM	disease inc.	1,43E-08	7,86E-09	4,22E-10	0,00E+00	7,17E-10	0,00E+00	9,97E-10	0,00E+00
IRP	kBq U235 eq	2,22E-02	1,03E-02	4,29E-03	0,00E+00	6,46E-04	0,00E+00	6,53E-04	0,00E+00
ETP-fw	CTUe	4,55E+00	1,62E+00	4,22E-01	0,00E+00	9,81E-02	0,00E+00	9,29E-02	0,00E+00
HTP-c	CTUh	6,35E-11	6,83E-11	9,98E-12	0,00E+00	3,18E-12	0,00E+00	2,36E-12	0,00E+00
HTP-nc	CTUh	1,61E-09	1,61E-09	2,84E-10	0,00E+00	1,03E-10	0,00E+00	6,15E-11	0,00E+00
SQP	Dimensionless	2,17E+00	9,03E-01	2,99E-01	0,00E+00	8,63E-02	0,00E+00	3,09E-01	0,00E+00
Capture	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								
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 experience with the indicator. 2 This impact category deals mainly with the eventual impact of low-dose ionizing radiation on the 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 44: Parameters describing resource use (CM 940 Industrial Top)

RESOURCE USE PER 1 KG									
Indicator	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
PERE	MJ	2,34E-01	3,93E-02	2,34E-01	0,00E+00	1,77E-03	0,00E+00	1,25E-03	0,00E+00
PERM	MJ	4,03E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PERT	MJ	2,38E-01	3,93E-02	2,34E-01	0,00E+00	1,77E-03	0,00E+00	1,25E-03	0,00E+00
PENRE	MJ	4,39E+00	1,96E+00	3,55E+00	0,00E+00	1,33E-01	0,00E+00	1,56E-01	0,00E+00
PENRM	MJ	1,65E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PENRT	MJ	6,04E+00	1,96E+00	3,55E+00	0,00E+00	1,33E-01	0,00E+00	1,56E-01	0,00E+00
SM	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
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
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
FW	m ³	1,03E-01	7,15E-03	1,06E-02	0,00E+00	3,78E-04	0,00E+00	6,63E-03	0,00E+00
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 freshwater
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Table 45: End-of-life (waste categories and output flows) (CM 940 Industrial Top)

WASTE CATEGORIES AND OUTPUT FLOWS PER 1 KG									
Indicator	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
HWD	kg	4,13E-06	5,11E-06	2,77E-07	0,00E+00	3,28E-07	0,00E+00	2,22E-07	0,00E+00
NHWD	kg	5,57E-02	6,06E-02	1,64E-03	0,00E+00	6,46E-03	0,00E+00	1,00E+00	0,00E+00
RWD	kg	1,43E-05	1,22E-05	1,08E-06	0,00E+00	8,50E-07	0,00E+00	9,64E-07	0,00E+00
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
MFR	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
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
EE	MJ	5,89E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
EET	MJ	5,66E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+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; EE = Exported energy, EET = exported thermal energy								

For all 10 Floor Screed products

Table 46: Biogenic carbon content per 1 kg for all 10 Floor Screed products

BIOGENIC CARBON CONTENT PER 1 kg		
Parameter	Unit	At the factory gate
Biogenic carbon content in product	[kg C]	0
Biogenic carbon content in accompanying packaging	[kg C]	0
Note	1 kg biogenic carbon is equivalent to 44/12 kg of CO ₂	

Additional information

LCA interpretation

The characterized results for CM Flow casting show that A1-A3 and A4 being by-far the biggest contributors, while C1-C4 account of only a small part. In most of the impact categories A1-A3 accounts for the majority of the impact; only for ODP and ADP is the impact from the other modules higher. The majority of life cycle energy consumption takes place during the production phase (A1-A3). Besides the cement also the dispersion powder influences the results significantly, although this is only used up to 5%. Significant contributions to Primary Energy Demand – Non-renewable (PENRT) derive from the energy resources used in the production of raw materials. The largest contributor to Primary Energy Demand – Renewable (PERT) is the consumption of renewable energy resources required for the generation and supply of electricity. During manufacturing (A1-A3) some influence also arises due to the wooden pallets and paper used as packaging that need solar energy for photosynthesis. It should be noted that Primary Energy Demand – Renewable

(PERT) generally represents a small percentage of the production phase primary energy demand with the bulk of the demand coming from non-renewable energy resources.

Technical information on scenarios

Table 47: Information related to module A4

Scenario information	Value	Unit
Fuel type	Diesel	-
Vehicle type	Euro 5	-
Transport distance	CM Flow casting: 244 CM Flow casting fiber: 244 CM Project: 244 CM Project Fiber: 244 CM Project Selfdrying: 244 CM 720 Fine: 244 CM 750 S: 244 CM 760 Fiber: 244 CM 920 Industrial: 244 CM 940 Industrial Top: 244	km
Capacity utilisation (including empty runs)	85 % for trucks	%
Gross density of products transported	930 kg/m ³ (with lorry)	kg/m ³
Capacity utilization volume factor	1	-

Table 48: Information related to module A5 (1 of 2) pr kg

Scenario information	Value					Unit
	CM Flow casting	CM Flow casting fiber	CM Project	CM Project fiber	CM Project Selfdrying	
Ancillary materials	-	-	-	-	-	kg
Water use	0,16	0,16	0,2	0,2	0,17	L/kg
Other resource use	-	-	-	-	-	kg
Energy type and consumption	0,019	0,019	0,019	0,019	0,019	MJ/kg
Waste materials	-	-	-	-	-	kg
Output materials	1	1	1	1	1	kg
Direct emissions to air, soil or water	-	-	-	-	-	kg

Table 49 Information related to module A5 (2 of 2) pr kg

Scenario information	Value					Unit
	CM 720 Fine	CM 750 S	CM 760 Fiber	CM 920 Industrial	CM 940 Industrial Top	
Ancillary materials	-	-	-	-	-	kg
Water use	0,2	0,24	0,18	0,18	0,2	L/kg
Other resource use	-	-	-	-	-	kg
Energy type and consumption	0,019	0,019	0,019	0,019	0,019	MJ/kg
Waste materials	-	-	-	-	-	kg
Output materials	1	1	1	1	1	kg
Direct emissions to air, soil or water	-	-	-	-	-	kg

Table 50: Reference service life

RSL information	Unit
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Reference service Life		Not declared
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

Use (B1-B7)

Modules not declared.

Table 51: Information related to modules C1-C4

Scenario information	Value	Unit
Collected separately	-	kg
Collected with mixed waste	-	kg
For reuse	-	kg
For recycling	-	kg
For energy recovery	-	kg
For final disposal	1	kg
Assumptions for scenario development		As appropriate

Table 52: Re-use, recovery and recycling potential (D)

Scenario information/Materiel	Value	Unit
No Energy recovery	0	kg
No Heat recovery	0	kg

Indoor air

The EPD does not give information on release of dangerous substances to indoor air because the horizontal standards on the relevant measurements are not available.

Soil and water

The EPD does not give information on release of dangerous substances to soil and water because the horizontal standards on the relevant measurements are not available.

References

Publisher	 www.epddanmark.dk
Programme operator	Danish Technological Institute Buildings & Environment Gregersensvej DK-2630 Taastrup www.teknologisk.dk
LCA-practitioner	<i>Odyssefs Papagiannidis</i> <i>Bureau Veritas, HSE Danmark</i> <i>Oldenborggade 25-31</i> <i>7000 Fredericia</i> <i>Denmark</i> <i>Julie M. Vejsgaard Larsen</i> <i>Bureau Veritas, HSE Danmark</i> <i>Oldenborggade 25-31</i> <i>7000 Fredericia</i> <i>Denmark</i>
LCA software /background data	SimaPro 9.3/ Ecoinvent 3.8 Generic data are primarily based on life cycle inventory data from SimaPro 9.3 Professional Database 2020 and Ecoinvent version 3.8
3rd party verifier	<i>Ninkie Bendtsen</i> <i>Niras A/S</i> <i>Sortemosevej 19</i> <i>3450 Allerød</i> <i>Denmark</i> www.niras.dk

General programme instructions

General Programme Instructions, version 2.0, spring 2020
www.epddanmark.dk

EN 15804:2012+A2:2019

Sustainability of construction works-Environmental Product Declarations-Core rules for the product category of construction products.

EN 15804

DS/EN 15804 + A1:2013 - "Bæredygtighed inden for byggeri og anlæg - Miljøvaredeklarationer - Grundlæggende regler for produktkategorien byggevarer"

EN 15942

DS/EN 15942:2011 – "Bæredygtighed inden for byggeri og anlæg - Miljøvaredeklarationer (EPD) - Kommunikationsformat: business-to-business (B2B)"

PCR

PCR 2019:14 Construction products and Construction services, Version 1.11

Sub-PCR-A

Sub-PCR-A Mortars applied to a surface (construction product) (2021-11-08) for the floor screed products

ISO 14025

DS/EN ISO 14025:2010 – "Miljømærker og -deklarationer - Type III-miljøvaredeklarationer - Principper og procedurer

ISO 14040

DS/EN ISO 14040:2008 – "Miljøledelse – Livscyklusvurdering – Principper og struktur"

ISO 14044

DS/EN ISO 14044:2008 – "Miljøledelse – Livscyklusvurdering – Krav og vejledning"

PEF 2018

Product Environmental Footprint Category Rules Guidance 2018