Statement of Verification

BREG EN EPD No.: 000721 Issue 01

This is to verify that the

Environmental Product Declaration

provided by:

CPV Ltd Woodington Mill

is in accordance with the requirements of:

EN 15804:2012+A2:2019

and

BRE Global Scheme Document SD207

This declaration is for:

1 linear meter of UltraCORE pipe with the average weight of 15.171 kg/m

Company Address

Woodington Mill,
CPV Ltd Woodington Mill,
East Wellow Romsey,
Hampshire.
SO51 6DQ

Signed for BRE Global Ltd	Hayley Thomson Operator	01 August 2025 Date of this Issue
01 August 2025 Date of First Issue		31 July 2030 Expiry Date

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Environmental Product Declaration

EPD Number: **000721**

General Information

EPD Programme Operator	Applicable Product Category Rules
BRE Global Watford, Herts WD25 9XX United Kingdom	BRE Environmental Profiles 2023 Product Category Rules for Type III environmental product declaration of construction products to EN 15804+A2 PN 514 Rev 3.1
Commissioner of LCA study	**LCA consultant/Tool**
Woodington Mill, CPV Ltd Woodington Mill, East Wellow Romsey, Hampshire. SO51 6DQ	Trident Utilities - Chris Wilson/ BRE LINA A2
Declared/Functional Unit	**Applicability/Coverage**
1 linear meter of UltraCORE pipe with the average weight of 15.171 kg/m	Product Average.
EPD Type	**Background database**
Cradle to Gate with Module C and D with options	Ecoinvent 3.8

Demonstration of Verification
CEN standard EN 15804 serves as the core PCR [a]
Independent verification of the declaration and data according to EN ISO 14025:2010 ☐Internal ☒ External
(Where appropriate [b])Third party verifier: Pat Hermon
a: Product category rules b: Optional for business-to-business communication; mandatory for business-to-consumer communication (see EN ISO 14025:2010, 9.4)

Comparability
Environmental product declarations from different programmes may not be comparable if not compliant with EN 15804:2012+A2:2019. Comparability is further dependent on the specific product category rules, system boundaries and allocations, and background data sources. See Clause 5.3 of EN 15804:2012+A2:2019 for further guidance

Information modules covered

Product			Construction		Use stage							End-of-life					Benefits and loads beyond the system boundary
					Related to the building fabric					Related to the building							
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4		D
Raw materials supply	Transport	Manufacturing	Transport to site	Construction – Installation	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	Deconstruction demolition	Transport	Waste processing	Disposal		Reuse, Recovery and/or Recycling potential
☑	☑	☑	☑	☑	☐	☐	☐	☐	☐	☐	☐	☑	☑	☑	☑		☑

Note: Ticks indicate the Information Modules declared.

Manufacturing site(s)

Woodington Mill,
CPV Ltd Woodington Mill,
East Wellow Romsey,
Hampshire.
SO51 6DQ

Construction Product:

Product Description

UltraCORE is a mother reel core specifically designed for paper and tissue manufacturing. CPV's UltraCORE offers robustness, providing a significantly extended service life compared to fibre (cardboard) cores. The durable construction of UltraCORE prevents issues such as delamination, collapse, or failure, ensuring a lifetime of uninterrupted production.

Paper and tissue manufacturers can achieve substantial reductions in operating costs thanks to the longevity of UltraCORE. This core is fully recyclable and has a lower carbon footprint due to its extended service life. Traditional fibre cores require frequent replacement, leading to higher emissions from raw material production, manufacturing, and transportation. In contrast, UltraCORE's long lifespan means fewer replacements and lower overall CO_2 emissions.

UltraCORE is engineered to have a design service life of at least 5 years in continuous operation within a typical paper or tissue manufacturing plant. Users have reported UltraCORE cores with service lives exceeding 25 years. In contrast, traditional fibre cores typically last for only 4 to 6 cycles, leading to frequent replacements and higher maintenance costs. This durability translates to less downtime and fewer disruptions, enabling manufacturers to maintain optimal productivity levels.

By reducing the need for multiple fibre cores, UltraCORE helps manufacturers decrease their environmental impact. The lower carbon footprint is a result of reduced emissions from various stages of the lifecycle, including raw material extraction, production processes, and transportation. This aligns with the growing demand for sustainable practices within the industry.

Furthermore, UltraCORE contributes to sustainability goals by being fully recyclable. At the end of its long service life, the material can be reprocessed and reused, minimising waste and supporting a circular economy. UltraCORE represents a significant advancement in the core manufacturing industry. Its robust design ensures a long service life, reducing operational costs and environmental impact. By choosing UltraCORE, paper and tissue manufacturers can achieve greater efficiency, sustainability, and reliability in their production processes. The results of the EPD refer to an average product weight of 15.171 kg/m. Information on the full product range,

6.58 to 21.35 kg/m, 179mm to 610 mm diameter cores is contain within. The EPD can then be used to indicate the GWP Impact for any size of core across the product range.

Technical Information

Property	Value, Unit
Density	6.5 kg/m to 21.3 kg/m
Cores	179mm up to 610 mm (24 inches)

Main Product Contents

Material/Chemical Input	%
Granules Virgin	90-95
Granules Recycled	4-5
Masterbatch	1-2
Printing Ink	<0.5

Note: Product contents is same for all products grouped in this EPD.

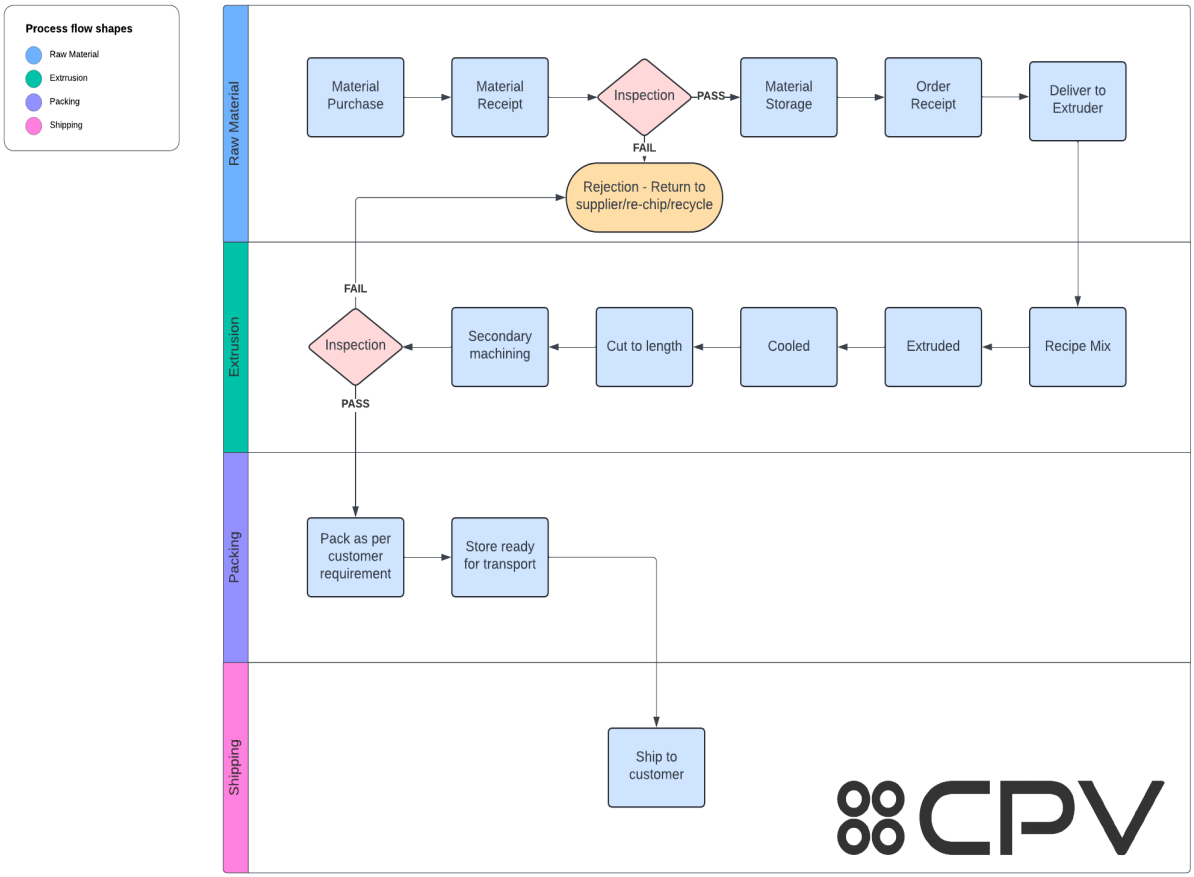
Manufacturing Process

1. Raw Material Preparation:
    - Granules: The raw material for extrusion is in the form of plastic polypropylene (PP) granules.
    - Granules are inspected and returned to supplier for re-chipping if rejected
    - Additives: The specified colorant is added to the mix, which is also in granular form.
2. Feeding the Extruder:
    - Hopper: The plastic pellets are fed into a hopper, which is a large container that holds the raw material.
    - Gravimetric Feeder: The hopper has a feeder that controls the amount of material entering the extruder to ensure consistent flow.
3. Melting and Mixing:
    - Extruder Barrel and Screw: The material moves from the hopper into the extruder barrel, which contains a rotating screw. This moves the material at a set speed.
    - Heating Zones: The barrel is divided into several heating zones that progressively increase in temperature, melting the plastic as it moves through.
    - Mixing: The screw not only pushes the material forward but also mixes it thoroughly to ensure uniform melting and consistency.

4. Extrusion:
    - Die: At the end of the extruder, the molten plastic is forced through a die, which shapes the material into the desired dimensions. The shape of the die determines the shape of the final product.
    - Cooling: As the extruded plastic exits the die, it is still hot and needs to be cooled to maintain its shape. This is done with several water baths.
5. Post-Extrusion Processing:
    - Haul-Off: A haul-off unit continuously draws the extruded product away from the die at a controlled speed, ensuring consistent thickness and shape.
    - Cutting: A cutting machine then cuts the pipe at the set length.
    - Processing: Any further processing to reach the desired finish (e.g. roughening or routering) is now done at this stage.
6. Quality Control/Inspection and Packing:
    - Inspection: The final product is inspected for quality, ensuring it meets specified dimensions, surface finish, and other properties. Any finished cores which fail at final inspection are re-chipped/ recycled.
    - Packing: The product is then packed as per customer specification requirements ready to be shipped.

UltraCORE is produced using modern extruders and can produce products ranging from 179mm up to 610 mm (24 inches).

Process flow diagram



Construction Installation

UltraCORE is delivered to the Paper Mill as finished product. It is used as a mother reel core specifically designed for paper and tissue manufacturing.

Use Information

There are no specific in use and maintenance requirements for UltraCORE. Life expectancy is 25 years plus.

End of Life

UltraCORE is a mother reel core specifically designed for use in paper and tissue manufacturing. At the end of its life, it will be manually removed from the machines and sent to a waste processing facility. It is assumed that 100% of the product is recovered for final disposal.

Life Cycle Assessment Calculation Rules

Declared / Functional unit description

1 linear meter of UltraCORE pipe with the average weight of 15.171 kg/m

System boundary

This is a Cradle-to-Gate with Options EPD, reporting the upstream processing stages A1 to A3, construction stages A4-A5, end-of-life stages C1-C4 and D in accordance with EN 15804:2012+A2:2019 and BRE 2023 Product Category Rules (PN 514 Rev 3.1).

Data sources, quality and allocation

The datasets are derived from Ecoinvent v3.8, and the LCA tool used was BRE LINA A2. The LCA analysis is conducted for the 1 liner meter of UltraCORE pipes with the average weight of 15.171 kg/m, and it includes the total amount of Polycarbonate granules used to manufacture the UltraCORE pipes over the period of one year (from 01/01/2023 to 31/12/2023). The results of this EPD refer to an average UltraCORE pipe with and average weight per metre of 15.17 kg/m. This is a weighted average for pipes ranging from 6.6 kg/m to 21.4 kg/m.

In addition to the UltraCORE product, other products are manufactured in the CPV manufacturing unit. Therefore, the allocation of electricity, fuel, waste, water consumption, and discharge are required. This allocation has been done according to the provisions of BRE PCR PN514 and EN 15804, using the mass production quantity. Site wide values for energy, water and wastewater have been taken from bills. The manufacturer has confirmed that the extrusion department is one of several departments consuming the company's electricity. It is estimated that the extrusion department accounts for approximately 40% of the total electricity consumption. The production of UltraCORE operates for 10 weeks out of 50 in the extrusion department, representing 20% of the year's operations. The same estimation has been applied for the Natural gas consumption. Further, the manufacturer has confirmed that they are using the on-site solar electricity production, and the supporting documents has been provided for the solar electricity generation on site and the electricity

Figures for the raw materials, ancillary materials and packaging were from actual usages. During the production process, polypropylene waste is sent for recycling and then returned to the manufacturing unit as recycled granulate, which is used as a raw material. The transportation distance for delivering the recycled polypropylene has been accounted for. However, there is no available dataset for recycled polypropylene granules in the backend database. As a result, the dataset for recycled polyethylene was used as a proxy. Further, the mass balance with the range i.e., total raw material quantity is equal to the production output of the product.

Secondary data has been obtained for all other upstream and downstream processes that are beyond the control of the manufacturer (i.e. raw material production) from the ecoinvent 3.8 database. All ecoinvent datasets are complete within the context used and conform to the system boundary and the criteria for the exclusion of inputs and outputs, according to the requirements specified in EN 15804:2012+A2:2019..

ISO14044 guidance. Quality Level	Geographical representativeness	Technical representativeness	Time representativeness
Very Good	Data from area under study.	Data from processes and products under study. Same state of technology applied as defined in goal and scope (i.e., identical technology).	n/a
Very Good	n/a	n/a	There is approximately 1-2 years between the Ecoinvent LCI reference year, and the time period for which the LCA was undertaken.

Specific European datasets have been selected from the ecoinvent LCI for this LCA. Manufacturer uses the national grid electricity and natural gas for production, so therefore the national grid electricity dataset has been used for the LCA modelling (Ecoinvent 3.8). The GWP carbon footprint for using 1 kWh of electricity is 0.239 kgCO2e/kWh, the GWP total for Solar PV is 0.021 kgCO2eq/kWh and for using the 1 kWh of natural gas is 0.232 kgCO2eq. The quality level of time representativeness is also Very Good as the background LCI datasets are based on ecoinvent v3.8 which was compiled in 2021. Therefore, there is less than 5 years between the ecoinvent LCI reference year and the time period for which the LCA was undertaken

Cut-off criteria

All raw materials and energy input to the manufacturing process have been included, except for direct emissions to air, water, and soil, which are not measured. The inventory process in this LCA includes all data related to raw material, packaging material and consumable items.

LCA Results

(MND = module not declared; MNR = module not relevant; INA = indicator not assessed; AGG = aggregated)

Parameters describing environmental impacts									
			GWP-total	GWP-fossil	GWP-biogenic	GWP-luluc	ODP	AP	EP-freshwater
			kg CO_2 eq	kg CO_2 eq	kg CO_2 eq	kg CO_2 eq	kg CFC11 eq	mol H^+ eq	kg $(PO_4)^{3-}$ eq
Product stage	Raw material supply	A1	3.01E+01	2.98E+01	2.02E-01	1.19E-02	4.26E-07	1.02E-01	3.73E-03
	Transport	A2	7.55E-01	7.55E-01	4.57E-04	3.73E-04	1.69E-07	1.04E-02	4.05E-05
	Manufacturing	A3	9.28E-01	1.95E+00	-1.03E+00	3.00E-03	4.28E-07	9.55E-03	5.33E-04
	Total (Consumption grid)	A1-3	3.17E+01	3.25E+01	-8.26E-01	1.53E-02	1.02E-06	1.22E-01	4.30E-03
Construction process stage	Transport	A4	2.18E+00	2.18E+00	1.53E-03	1.12E-03	4.83E-07	3.16E-02	1.25E-04
	Construction	A5	1.50E+00	1.56E-01	1.35E+00	9.56E-05	1.22E-08	4.58E-04	2.01E-05
Use stage	Use	B1	MND	MND	MND	MND	MND	MND	MND
	Maintenance	B2	MND	MND	MND	MND	MND	MND	MND
	Repair	B3	MND	MND	MND	MND	MND	MND	MND
	Replacement	B4	MND	MND	MND	MND	MND	MND	MND
	Refurbishment	B5	MND	MND	MND	MND	MND	MND	MND
	Operational energy use	B6	MND	MND	MND	MND	MND	MND	MND
	Operational water use	B7	MND	MND	MND	MND	MND	MND	MND
100% - Incineration									
End of life	Deconstruction, demolition	C1	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**
	Transport	C2	**5.05E-02**	**5.04E-02**	**4.30E-05**	**1.98E-05**	**1.17E-08**	**2.05E-04**	**3.25E-06**
	Waste processing	C3	**3.84E+01**	**3.84E+01**	**2.08E-03**	**8.81E-05**	**2.96E-08**	**4.93E-03**	**4.11E-05**
	Disposal	C4	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	**-1.27E+01**	**-1.25E+01**	**-1.80E-01**	**-1.43E-02**	**-8.69E-07**	**-7.26E-02**	**-7.26E-03**

GWP-total = Global warming potential, total;
GWP-fossil = Global warming potential, fossil;
GWP-biogenic = Global warming potential, biogenic;
GWP-luluc = Global warming potential, land use and land use change;

ODP = Depletion potential of the stratospheric ozone layer;
AP = Acidification potential, accumulated exceedance; and
EP-freshwater = Eutrophication potential, fraction of nutrients reaching freshwater end compartment

LCA Results (continued)

(MND = module not declared; MNR = module not relevant; INA = indicator not assessed; AGG = aggregated)

Parameters describing environmental impacts									
			EP-marine	EP-terrestrial	POCP	ADP-mineral &metal	ADP-fossil	WDP	PM
			kg N eq	mol N eq	kg NMVOC eq	kg Sb eq	MJ, net calorific value	m^3 world eq deprived	disease incidence
Product stage	Raw material supply	A1	1.81E-02	1.89E-01	9.09E-02	1.97E-04	1.07E+03	1.32E+01	1.09E-06
	Transport	A2	2.69E-03	2.98E-02	8.14E-03	1.68E-06	1.10E+01	4.53E-02	6.44E-08
	Manufacturing	A3	2.07E-03	2.02E-02	6.53E-03	6.13E-05	5.65E+01	8.95E-01	9.17E-08
	Total (Consumption grid)	A1-3	2.28E-02	2.39E-01	1.06E-01	2.60E-04	1.14E+03	1.42E+01	1.24E-06
Construction process stage	Transport	A4	8.14E-03	9.01E-02	2.45E-02	4.36E-06	3.17E+01	1.37E-01	1.86E-07
	Construction	A5	1.75E-04	1.42E-03	4.59E-04	7.66E-07	1.57E+00	3.49E-02	9.33E-09
Use stage	Use	B1	MND	MND	MND	MND	MND	MND	MND
	Maintenance	B2	MND	MND	MND	MND	MND	MND	MND
	Repair	B3	MND	MND	MND	MND	MND	MND	MND
	Replacement	B4	MND	MND	MND	MND	MND	MND	MND
	Refurbishment	B5	MND	MND	MND	MND	MND	MND	MND
	Operational energy use	B6	MND	MND	MND	MND	MND	MND	MND
	Operational water use	B7	MND	MND	MND	MND	MND	MND	MND
100% - Incineration									
End of life	Deconstruction, demolition	C1	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Transport	C2	6.16E-05	6.74E-04	2.06E-04	1.75E-07	7.62E-01	3.43E-03	4.35E-09
	Waste processing	C3	2.41E-03	2.59E-02	6.93E-03	8.51E-07	1.89E+00	3.46E-01	3.96E-08
	Disposal	C4	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	-1.07E-02	-1.05E-01	-2.95E-02	-7.72E-06	-2.03E+02	-5.51E+00	-4.90E-07

EP-marine = Eutrophication potential, fraction of nutrients reaching marine end compartment;
EP-terrestrial = Eutrophication potential, accumulated exceedance;
POCP = Formation potential of tropospheric ozone;
ADP-mineral&metals = Abiotic depletion potential for non-fossil resources;
ADP-fossil = Depletion potential of the stratospheric ozone layer;
WDP = Water (user) deprivation potential, deprivation-weighted water consumption; and
PM = Particulate matter.

LCA Results (continued)

(MND = module not declared; MNR = module not relevant; INA = indicator not assessed; AGG = aggregated)

Parameters describing environmental impacts							
			IRP	ETP-fw	HTP-c	HTP-nc	SQP
			kBq U^{235} eq	CTUe	CTUh	CTUh	dimensionless
Product stage	Raw material supply	A1	1.60E+00	1.33E+02	7.50E-09	1.76E-07	2.66E+01
	Transport	A2	5.42E-02	8.08E+00	3.37E-10	7.92E-09	8.79E+00
	Manufacturing	A3	1.11E+00	5.10E+01	2.75E-09	4.76E-08	1.20E+02
	Total (Consumption grid)	A1-3	2.77E+00	1.92E+02	1.06E-08	2.31E-07	1.56E+02
Construction process stage	Transport	A4	1.59E-01	2.32E+01	9.72E-10	2.25E-08	2.58E+01
	Construction	A5	8.49E-03	1.55E+00	1.83E-10	1.69E-09	1.24E+00
Use stage	Use	B1	MND	MND	MND	MND	MND
	Maintenance	B2	MND	MND	MND	MND	MND
	Repair	B3	MND	MND	MND	MND	MND
	Replacement	B4	MND	MND	MND	MND	MND
	Refurbishment	B5	MND	MND	MND	MND	MND
	Operational energy use	B6	MND	MND	MND	MND	MND
	Operational water use	B7	MND	MND	MND	MND	MND
100% - Incineration							
End of life	Deconstruction, demolition	C1	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Transport	C2	3.92E-03	5.95E-01	1.93E-11	6.24E-10	5.24E-01
	Waste processing	C3	9.15E-03	9.26E+00	5.33E-09	3.59E-08	6.81E-01
	Disposal	C4	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	-3.47E+00	-1.78E+02	-2.99E-09	-9.43E-08	-5.89E+01

IRP = Potential human exposure efficiency relative to U235;
ETP-fw = Potential comparative toxic unit for ecosystems;
HTP-c = Potential comparative toxic unit for humans;
HTP-nc = Potential comparative toxic unit for humans; and
SQP = Potential soil quality index.

LCA Results (continued)

(MND = module not declared; MNR = module not relevant; INA = indicator not assessed; AGG = aggregated)

Parameters describing resource use, primary energy								
			PERE	PERM	PERT	PENRE	PENRM	PENRT
			MJ	MJ	MJ	MJ	MJ	MJ
Product stage	Raw material supply	A1	1.55E+01	1.87E-02	1.55E+01	5.43E+02	5.15E+02	1.06E+03
	Transport	A2	1.17E-01	0.00E+00	1.17E-01	1.04E+01	0.00E+00	1.04E+01
	Manufacturing	A3	3.00E+01	1.28E+01	4.28E+01	4.89E+01	1.66E+01	6.55E+01
	Total (Consumption grid)	A1-3	4.56E+01	1.28E+01	5.84E+01	6.02E+02	5.32E+02	1.13E+03
Construction process stage	Transport	A4	3.35E-01	0.00E+00	3.35E-01	3.05E+01	0.00E+00	3.05E+01
	Construction	A5	-9.16E+00	9.19E+00	2.59E-02	-1.67E+01	1.70E+01	3.27E-01
Use stage	Use	B1	MND	MND	MND	MND	MND	MND
	Maintenance	B2	MND	MND	MND	MND	MND	MND
	Repair	B3	MND	MND	MND	MND	MND	MND
	Replacement	B4	MND	MND	MND	MND	MND	MND
	Refurbishment	B5	MND	MND	MND	MND	MND	MND
	Operational energy use	B6	MND	MND	MND	MND	MND	MND
	Operational water use	B7	MND	MND	MND	MND	MND	MND
100% - Incineration								
End of life	Deconstruction, demolition	C1	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Transport	C2	1.07E-02	0.00E+00	1.07E-02	7.49E-01	0.00E+00	7.49E-01
	Waste processing	C3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Disposal	C4	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	-3.04E+01	0.00E+00	-3.04E+01	-2.04E+02	0.00E+00	-2.04E+02

PERE = Use of renewable primary energy excluding renewable primary energy 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 resource

LCA Results (continued)

(MND = module not declared; MNR = module not relevant; INA = indicator not assessed; AGG = aggregated)

Parameters describing resource use, secondary materials and fuels, use of water						
			SM	RSF	NRSF	FW
			kg	MJ net calorific value	MJ net calorific value	m^3
Product stage	Raw material supply	A1	7.31E-01	0.00E+00	0.00E+00	3.13E-01
	Transport	A2	0.00E+00	0.00E+00	0.00E+00	1.12E-03
	Manufacturing	A3	4.80E-02	2.55E-05	0.00E+00	2.64E-02
	Total (Consumption grid)	A1-3	7.79E-01	2.55E-05	0.00E+00	3.41E-01
Construction process stage	Transport	A4	0.00E+00	0.00E+00	0.00E+00	3.38E-03
	Construction	A5	4.51E-05	0.00E+00	0.00E+00	8.43E-04
Use stage	Use	B1	MND	MND	MND	MND
	Maintenance	B2	MND	MND	MND	MND
	Repair	B3	MND	MND	MND	MND
	Replacement	B4	MND	MND	MND	MND
	Refurbishment	B5	MND	MND	MND	MND
	Operational energy use	B6	MND	MND	MND	MND
	Operational water use	B7	MND	MND	MND	MND
100% - Incineration						
End of life	Deconstruction, demolition	C1	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Transport	C2	0.00E+00	0.00E+00	0.00E+00	8.50E-05
	Waste processing	C3	0.00E+00	0.00E+00	0.00E+00	8.12E-03
	Disposal	C4	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	0.00E+00	0.00E+00	0.00E+00	-1.37E-01

SM = Use of secondary material;
RSF = Use of renewable secondary fuels;
NRSF = Use of non-renewable secondary fuels;
FW = Net use of fresh water

LCA Results (continued)

(MND = module not declared; MNR = module not relevant; INA = indicator not assessed; AGG = aggregated)

Other environmental information describing waste categories					
			HWD	NHWD	RWD
			kg	kg	kg
Product stage	Raw material supply	A1	6.92E-01	1.64E+01	4.71E-04
	Transport	A2	1.22E-02	1.72E-01	4.65E+01
	Manufacturing	A3	1.10E-01	2.35E+00	3.97E-04
	Total (Consumption grid)	A1-3	8.14E-01	1.90E+01	4.65E+01
Construction process stage	Transport	A4	3.56E-02	4.94E-01	1.41E+02
	Construction	A5	4.49E-03	6.54E-02	1.79E-06
Use stage	Use	B1	MND	MND	MND
	Maintenance	B2	MND	MND	MND
	Repair	B3	MND	MND	MND
	Replacement	B4	MND	MND	MND
	Refurbishment	B5	MND	MND	MND
	Operational energy use	B6	MND	MND	MND
	Operational water use	B7	MND	MND	MND
100% - Incineration					
End of life	Deconstruction, demolition	C1	0.00E+00	0.00E+00	0.00E+00
	Transport	C2	8.40E-04	1.49E-02	5.16E-06
	Waste processing	C3	0.00E+00	0.00E+00	0.00E+00
	Disposal	C4	0.00E+00	0.00E+00	0.00E+00
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	-8.21E-01	-4.42E+01	-1.04E-03

HWD = Hazardous waste disposed;
NHWD = Non-hazardous waste disposed;
RWD = Radioactive waste disposed

LCA Results (continued)

(MND = module not declared; MNR = module not relevant; INA = indicator not assessed; AGG = aggregated)

Other environmental information describing output flows – at end of life								
			CRU	MFR	MER	EE	Biogenic carbon (product)	Biogenic carbon (packaging)
			kg	kg	kg	MJ per energy carrier	kg C	kg C
Product stage	Raw material supply	A1	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Transport	A2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Manufacturing	A3	0.00E+00	4.43E-04	1.91E-07	2.05E-02	2.38E-02	-3.60E-01
	Total (Consumption grid)	A1-3	0.00E+00	4.43E-04	1.91E-07	2.05E-02	2.38E-02	-3.60E-01
Construction process stage	Transport	A4	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Construction	A5	0.00E+00	3.72E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Use stage	Use	B1	MND	MND	MND	MND	MND	MND
	Maintenance	B2	MND	MND	MND	MND	MND	MND
	Repair	B3	MND	MND	MND	MND	MND	MND
	Replacement	B4	MND	MND	MND	MND	MND	MND
	Refurbishment	B5	MND	MND	MND	MND	MND	MND
	Operational energy use	B6	MND	MND	MND	MND	MND	MND
	Operational water use	B7	MND	MND	MND	MND	MND	MND
100% - Incineration								
End of life	Deconstruction, demolition	C1	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Transport	C2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Waste processing	C3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Disposal	C4	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

CRU = Components for reuse;
MFR = Materials for recycling

MER = Materials for energy recovery;
EE = Exported Energy

Scenarios and additional technical information

Scenarios and additional technical information			
Scenario	Parameter	Units	Results
A4 – Transport to the building site	Analysis undertaken of deliveries to customers in the UK, France, USA, Spain, and Turkey by road sea and train.		
	Transport by Road to ports (km)	Diesel, 16-32 tonne lorry	979
	Transport by Rail (km)	Rail transport	56.33
	Transport by Sea (km)	Ship, sea	5528
	Capacity utilisation (incl. empty returns)	%	26
	Bulk density of transported products	kg/m^3	303.42
A5 – Installation in the building	The product is delivered as a finished product to paper producers and lifted onto paper mill as required. There are no ancillary materials associated with installation but there will be packaging waste when the Cores are received at the Paper Mills		
	Pallets to recycling	kg	0.0485
	Toppers (wood) to recycling	kg	0.0108
	Polyester Straps – Plastic waste to recycling	kg	0.0023
	Galvanised Steel Buckles – steel waste to recycling	kg	0.0005
C1 - Deconstruction	UltraCORE is a mother reel core specifically designed for use in paper and tissue manufacturing. At the end of its life, it will be manually removed from the machines and sent to a waste processing facility. It is assumed that 100% of the product is recovered for final disposal.		
C2 – Transportation	Assumption made that waste disposal site/ recycling is 20 km max from paper mill site		
	Road transport	km	20
C3 – Preprocessing	Once the UltraCORE product reaches the waste processing facility, it will undergo appropriate processing. Since the product is made of polypropylene granules, the most suitable end-of-life scenario has been selected. These items can ultimately be collected, cleaned, and repurposed or, more likely, recycled for reuse in new production parts. However, there is currently no process in place to deconstruct or recycle the product. Therefore, an industrial average end-of-life data has been used according to BRE 2023 Product Category Rules (PN 514 Rev 3.1), which is 100% of waste to energy recovery.		
	Polypropylene waste to incineration	%	100
C4 – Disposal	100% of product will be incinerated at waste processing facility, therefore no waste to end up in landfilling. Hence, no impacts form C4- Disposal.		
Module D	The UltraCORE product is made up of post-consumer polypropylene and virgin polypropylene granules. In calculating the benefits of incinerating the waste polypropylene at the end of life, the pre-existing recycled content has been removed, and the incineration benefits have been calculated for only virgin inputs. The benefits of Module D include the energy credits from waste incineration of plastic for energy generation at the end-of-life. Benefits due to incineration of polypropylene = 14.53 kg/m		

Interpretation of results:

The bulk of the environmental impacts and primary energy demand are attributed to the manufacturing phase, covered by information modules A1-A3 of EN15804:2012+A2:2019. In an UltraCORE product manufacturing, Polypropylene granulate comprises 95% of its composition, post-consumer waste plastic accounts for 4%, coloured polypropylene skin and ink makes up 0-1%. When calculating environmental impacts, it's observed that Polypropylene granulate incurs the majority of impacts during the production phase, followed by post-consumer plastics and coloured resins.

References

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