Statement of Verification

BREG EN EPD No.: 000717 Issue 01

This is to verify that the

Environmental Product Declaration

provided by:

Kilwaughter Minerals Limited

BRE Global Verified EPD

is in accordance with the requirements of:

EN 15804:2012+A2:2019

and

BRE Global Scheme Document SD207

This declaration is for:

1 tonne of Polymer modified render products

Company Address

Kilwaughter Minerals Limited,
9 Starbog Road,
Larne,
N Ireland,
BT40 2TJ

Kilwaughter

Signed for BRE Global Ltd	Emma Baker Operator	11 August 2025 Date of this Issue
11 August 2025 Date of First Issue		10 August 2030 Expiry Date

BRE Global Verified EPD

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ECO PLATFORM EPD VERIFIED

Environmental Product Declaration

EPD Number: 000717

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**
Kilwaughter Minerals Limited, 9 Starbog Road, Larne, N Ireland, BT40 2TJ	Bala Subramanian/ BRE LINA A2
Declared/Functional Unit	**Applicability/Coverage**
1 tonne of Polymer modified render products	Product specific
EPD Type	**Background database**
Cradle to Gate 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: Roger Connick
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)

This environmental product declaration is for 1 tonne of Polymer modified render products produced by Kilwaughter Minerals Ltd at the following manufacturing facility

Kilwaughter Minerals Ltd,
9 Starbog Road,
Larne,
N Ireland,
BT40 2TJ

Construction Product:

Product Description

The scope of this EPD incorporates the Environmental Product Declaration for polymer modified render products. Since the composition and manufacturing process are the same for all renders, an LCA analysis has been conducted for each render product, and the individual product results are included in this EPD. These nine products, detailed below, are manufactured in accordance with a quality system approved to BS EN ISO 9001:2015 by BSI registration number FM 85394.

1. COM REND

COM Rend is a cement based, and polymer modified self-coloured render, requiring only the addition of water and 10 minutes mixing time. If applied as per manufacturer's instructions, an attractive, low maintenance textured finish is achieved. COM REND is kitemarked and CE marked to BS EN 998:1 and manufactured in accordance with a quality system approved to BS EN ISO 9001:2015 by BSI registration number FM 85394.

COM REND may be hand or machine applied. COM REND may be used over K Rend Base Coat as part of a two-coat system, each 10-12mm thick. It should be applied to a uniform thickness to line and level.

- Coverage: 2kg/ mm thick/ m^2
- Required: 20 - 24kg/ m^2 appx.

COM REND is also designed as a one-coat finish over block- work. It is applied to a minimum 16mm thick, possibly in two passes, and scraped to produce a uniform texture, thus saving labour and scaffold time.

- Coverage: 2kg/ mm thick/ m^2
- Required: 32 - 34kg/ m^2 appx.

2. SILICONE DASH RECEIVER

Silicone Dash Receiver is specifically designed to incorporate the benefits of silicone water repellents into a cement-based render system. Silicone adds a high-water repellent quality, while allowing water vapour to pass freely through the render; thus the amount of dirt adhering to the surface is greatly reduced, ensuring a freshly rendered appearance for a prolonged period of time. This dry surface also improves the resistance of the finished render to algae growth and the natural phenomenon of lime-bloom.

- Coverage: 1.5kg/ mm thick/ m^2
- Required: 10 – 15kg/ m^2 approx.
- Nominal:6 – 10 mm thickness
- Water required: 5 – 6L / bag

3. OVERCOATING SILICONE DASH RECEIVER

Overcoating Silicone Dash Receiver is specifically designed as a lightweight, refurbishment render where application takes place over existing dry dash finishes. Incorporating low density technologies, use of Overcoating Silicone Dash Receiver will reduce the total mass of coating on the façade. Applied to a thickness of 8 – 10mm.

- Coverage: 1.0kg/ mm thick/ m^2
- Required: 10 – 15kg/ m^2 approx.
- Nominal: 8 – 10mm thickness
- Water required: 4.5 – 5.5L / bag

4. STANDARD DASH RECEIVER

Standard Dash Receiver is designed for general use and normally applied on to K Rend Base Coats. Applied to a thickness of 6 – 10mm, depending on the size of the dashing aggregate.

- Coverage: 1.5kg/ mm thick/ m^2
- Required: 10 – 15kg/ m^2 approx.
- Nominal:6 – 10mm thickness
- Water required: 5 – 6L / bag

5. HP DASH RECEIVER

HP Dash Receiver is formulated with additional polymer for enhanced adhesion and flexibility, normally applied on to K Rend HP12 Base. Applied to a thickness of 6 – 10mm, dependant on the size of the dashing aggregate.

- Coverage: 1.5kg/ mm thick/ m^2
- Required: 10 – 15kg/ m^2 approx.
- Nominal:6 – 10mm thickness
- Water required: 4.5 – 5.5L / bag

6. K1 SPRAY+

K1 Spray+ is one coat two pass through coloured render which provides a fine texture finish. K1 Spray+ is designed for render spray machines as well as hand application. It is suitable for both new build and refurbishment projects. K1 Spray+ is available in 20 standard colors.

K1 Spray+ will provide an attractive, low maintenance finish. K Rend K1 Spray+ is a factory-made product, Kitemarked and CE marked to BS EN 998:1, and manufactured in accordance with a quality system approved to BS EN ISO 9001:2015 by BSI registration number FM 85394.

- One Coat Coverage: 1.6 kg/ mm thick / m^2 *Coverage may be reduced if hand applied.
- One Coat Requires: 26 - 32kg / m^2 approx.
- Nominal 16 - 20mm thickness

K1 Spray+ is normally applied in two passes depending on background conditions and the final finish required. It is important that a consistent minimum finished thickness is achieved over the whole surface and that the maximum recommended thicknesses are not exceeded.

7. K DASH TRADITIONAL FINE MORTAR

K Dash Traditional Mortar is a cement-based mortar requiring only the addition of water and 5 minutes mixing time. If used as per manufacturer's instructions, it can result in minimum wastage and provide a cost-effective solution for dry dashing. K Dash Traditional Mortar is kitemarked and CE marked to BS EN 998:1 and manufactured in accordance with a quality system approved to BS EN ISO 9001:2015 by BSI registration number FM 85394.

TRADITIONAL FINE MORTAR

- For general use, normally applied on to an approved basecoat. Apply 6 - 10mm thick, depending on the size of the dashing aggregate
- Coverage: 1.8kg per mm thick/ m^2
- Required: 10 - 18kg/ m^2 approx.

8. SILICONE FT

Silicone FT is a water-repellent, cement-based, and polymer-modified self-colored render, requiring only the addition of water and 10 minutes of mixing time.

SILICONE FT is specifically designed to incorporate the benefits of silicone water repellents into a cement-based render system. Silicone adds a high-water repellent quality, while allowing water vapor to pass freely through the render; thus, the amount of dirt adhering to the surface is greatly reduced, ensuring a freshly rendered appearance for a prolonged period of time. This dry surface also improves the resistance of the finished render to algae growth and the natural phenomenon of lime-bloom.

SILICONE FT may be used over K-Rend Base Coat as part of a two-coat system, each 10 - 12mm thick. It should be applied to a uniform thickness to line and level.

- Coverage: 2kg/ mm thick/ m^2
- Required: 20-24kg/ m^2 appx.

SILICONE FT is also designed as a one-coat finish over blockwork. It is applied to a minimum 16mm thick, possibly in two passes, and scraped to produce a uniform texture, thus saving labour and scaffold time.

- Coverage: 2kg/ mm thick/ m^2
- Required: 32-34kg/ m^2 appx.

For insulation, concrete, refurbishment work or any other unusual substrate, seek technical advice.

9. SILICONE K1

Silicone K1 is a water repellent, cement based, polymer modified, self-colored render, requiring only the addition of water and 10 minutes mixing time. If applied as per manufacturer's instructions, Silicone K1 will provide an attractive, low maintenance finish. K Rend Silicone K1 is kitemarked and CE marked to BS EN 998:1 and manufactured in accordance with a quality system approved to BS EN ISO 9001:2015 by BSI registration number FM 85394.Silicone K1 is specifically designed to incorporate the benefits of silicone water repellents into a cement-based render system.

Silicone adds a high-water repellent quality, while allowing water vapour to pass freely through the render; thus the amount of dirt adhering to the surface is greatly reduced, ensuring a freshly rendered appearance for a prolonged period of time. This dry surface also improves the resistance of the finished render to algae growth and the natural phenomenon of lime-bloom.

- One Coat Coverage: 1.6 kg / mm thick / m^2
- One Coat Require: 26 - 32kg / m^2 approx.
- Nominal 16 - 20mm thickness

Silicone K1 is normally applied in two passes depending on background conditions and final finish required. It is important that a consistent minimum finished thickness is achieved over the whole surface and that the maximum recommended thicknesses are not exceeded.

Technical Information

Property	Standards	Comrend	HP Dash Receiver	K Dash Traditional Fine Mortar	K1 Spray+
Dry Bulk Density (kg/m3)	EN 1015-10	1530 - 1870	1400-1550	1400-1550	1150-1400
Compressive Strength	EN 1015-11	CS III	CS III	CS III	CS II
Adhesion (N/mm^2 and fracture pattern)	EN 1015-21	-	-	-	0.29 (FP A)
	EN 1015-12	≥ 0.2 (FP- A/B)	≥ 0.2 (FP-A/B)	≥ 0.2 (FP-A/B)	-
Capillary water absorption (categories)	EN 1015-18	W_c 2	W_c 1	W_c 1	W_c 2
Water permeability on relevant substrates after weathering (ml/cm2 after 48 h)	EN 1015-21	-	-	-	≤ 0.1
Water vapour permeability coefficient (μ)	EN 1015-19	≤15	≤15	≤15	≤15
Thermal conductivity mean λ10, dry, mat (W/m.K)	EN 1745	0.75	0.47	0.47	0.39
Reaction to fire (class)	EN 13501-1	A1	A1	A1	A1
Durability	EN 1015-18	-	NPD	NPD	-
	EN 998-1, Para 5.2.3.1	-	-	-	Suitable as a One Coat Render

Property	Standards	Overcoating Silicone Dash	Silicone Dash Receiver	Silicone FT	Silicone K1	Standard Dash Receiver
Dry Bulk Density (kg/m3)	EN 1015-10	930-1200	1300-1550	1300-1600	1250-1550	1400-1550
Compressive Strength	EN 1015-11	CS II	CS III	CS II	CS II	CS III
Adhesion (N/mm2 and fracture pattern)	EN 1015-21	-	-	0.27 (FP A/B)	0.27 FP-A	-
	EN 1015-12	0.14 (FP- B)	0.2 (FP-A/B)	-	-	0.2 (FP-A/B)
Capillary water absorption (categories)	EN 1015-18	W_c 2	W_c 1	W_c 2	W_c 2	W_c 1
Water permeability on relevant substrates after weathering (ml/cm2 after 48 h)	EN 1015-21	-	-	≤ 0.08	≤ 0.1	-
Water vapour permeability coefficient (μ)	EN 1015-19	<10	≤15	≤ 25	< 15	≤15
Thermal conductivity mean λ10, dry, mat (W/m.K)	EN 1745	0.31	0.44	0.47	0.43	0.47
Reaction to fire (class)	EN 13501-1	A1	A1	A1	A1	A1
Durability	EN 1015-18	NPD	NPD	-	-	NPD
	EN 998-1, Para 5.2.3.1	-	-	Suitable as a One Coat Render	Suitable as a One Coat Render	-

Note: For more information, please contact Kilwaughter technical team

Product image:

The picture below represents the K Rend and K1 Spray+ products.

Main Product Contents

Material/Chemical Input	%
Portland Cement Clinker (White)	≥ 10 – < 25
Calcium Hydroxide	≥ 1 – < 3
Potassium Aluminium Silicate	≥ 0.1 – < 1
Sand	≥75
Others	<2

Note: Please contact the Kilwaughter minerals technical team for more information and please refer the individual product Safety Data sheet for more information on the composition of the product.

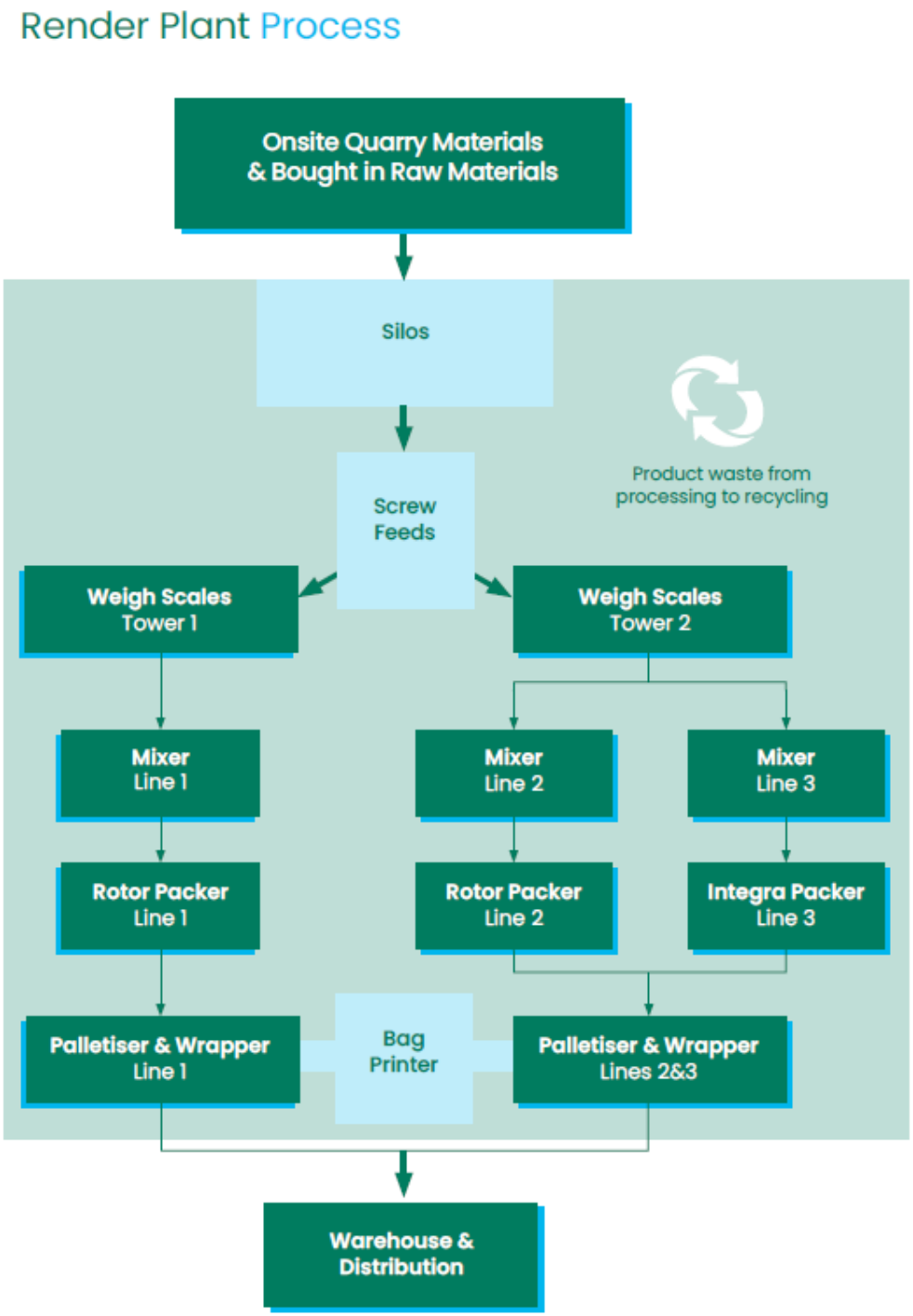
Manufacturing Process

The product is manufactured in a computer-controlled batch mixing plant, which incorporates individual weigh-bins, transfer screw conveyors, and a mixer. A production list is created by the Production Supervisor and issued to the batch mixing plant operator. Using this list, the operator selects the relevant recipe, inputs the required quantity, and the computer then manufactures the product. The system is pre-programmed with the formulations, mixing sequence, and mixing times.

Once the final blend is produced, it is released to an automatic packing machine, which packs it into 25 kg, 3-ply poly-lined paper sacks with weldable external valves. The computer-controlled batch mixing plant includes an alarm system that detects tolerance errors if conditions fluctuate outside the pre-set program. The operator investigates these errors and must acknowledge them on the computer before production can continue. Records are stored electronically. Forty 25 kg sacks are stacked onto a timber pallet and are check-weighed weekly using a weighbridge. The required weight is 1.00 tonne ± 100 kg.

Note: National grid electricity has been used for product manufacturing, and all production waste has been sent for recycling

Process flow diagram



Construction Installation

With the exception of Com Rend, renders are optimised for application through electric or diesel plastering machines. Guidance on optimal water flow settings and machine setup is available from Kilwaughter Minerals Ltd. For hand application, the product requires approximately 5.3 – 5.5 litres of clean water per 25 kg.

Spray machines are different in that they measure water flow in terms of L/Hr. This varies depending on the rotor and stator used, the machine used and the speed setting on the machine. It should all average out to be similar to the 5.5 L/25 kg bag though as you are bringing it to a similar work ability.

In this analysis, 5.5 L/25 kg has been used for the LCA analysis. The DU is 1 tonne, therefore the amount of water used for 1 tonne of render is 240 litres. Installation rate of 4% has been taken from BRE PCR EN15804 3.1.

Please contact Kilwaughter Minerals technical team for more information.

End of Life

Polymer Modified Render is a versatile rendering mortar used as a multi-coat application for both internal and external surfaces. At the end of its life, the render will be manually removed using tools like hammers or chisels. The waste cement render can potentially be crushed and reused as aggregate in concrete or road base material. In some cases, polymer-modified cement render can also be fed into rotary kilns in cement production, where the high temperatures break down the polymers, converting waste into energy.

For this analysis, a 100% recovery rate is assumed from the demolition site, with materials sent to a waste processing facility. Based on the BRE PCR 3.1 guidelines, 90% of the waste render is projected to be recycled, with the remaining 10% directed to landfill.

Life Cycle Assessment Calculation Rules

Declared / Functional unit description

1 tonne of Polymer modified render products

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

This is a product-specific EPD, and the LCA analysis has been conducted for individual products due to their similar composition and manufacturing process, as per BRE PCR EN 15804 V3.1. To maintain transparency and consistency, the following product results are included: K1 Spray+, K Dash Traditional Fine Mortar, HP Dash Receiver, Comrend, Silicone Dash Receiver, Silicone FT, Silicone K1, Overcoating Silicone Dash Receiver, and Standard Dash Receiver. 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 tonne of Polymer modified render products manufactured over the period of one year (from 01/05/2023 to 30/04/2024).

In addition to polymer-modified render products, other products are also manufactured at the Kilwaughter manufacturing site. Therefore, the allocation of water consumption, diesel, gas canisters, waste, non-production waste, and wastewater discharge has been conducted in accordance with the provisions of BRE PCR PN514 and EN 15804, using mass production quantities as the allocation basis. The manufacturer has confirmed that the wastage is sold as a co-product, and the revenue from it is less than 1%. Therefore, in accordance with the BRE PCR, the impacts have been allocated using physical allocation. Site-wide data for energy, water, waste, non-production waste, and wastewater has been based on actual measured quantities. Electricity consumption has been allocated by calculating the kWh required to produce one tonne of product, converting this to a per-kilogram value, and multiplying it by the total production quantity.

Waste quantities have been accounted for from several sources, including product changeovers, system purges using Mastercal, QA waste (e.g., over/underweight bags, contamination), overproduction (non-stock items or minimum order quantities), outdated finished goods. The manufacturer has confirmed that these wastes are either sold as co-products or rebranded and sold under different product lines. While this may suggest the need for economic allocation, in accordance with BRE EN 15804 +A2 PCR, because the revenue from co-products is less than 25%, physical allocation has been applied instead. Therefore, these waste streams have been allocated to products by mass.

Upon data review, it is noted that the output is slightly higher than the input however the mass balance is within the acceptable range. In addition, during the LCA modelling, some chemicals are not available in the ecoinvent database therefore the most suitable proxy has been selected for the LCA modelling. Figures for the raw materials, ancillary materials and packaging were from actual usages. 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).	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 UK consumption mix electricity is 0.239 kgCO2e/kWh and for using 1 kWh of natural gas at industrial furnace (the UK) it 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 inputs to the manufacturing process have been included, except for direct emissions to water and soil, which are not measured. The inventory process in this LCA includes all data related to raw materials, packaging materials, consumables, and emissions to air.

LCA Results Summary:

Summary of Main Indicators (A1-A3)					
Product	**Global warming (GWP-total)**	**Non-renewable consumption (ADPF)**	**Primary energy usage (PERT+PENRT)**	**Waste Production (HWD+NHWD+RWD)**	**Water Consumption (FW)**
Unit – 1 tonne	kg CO2 eq	MJ	MJ	Kg	m3
K1 Spray+	1.63E+02	1.93E+03	3.39E+03	1.67E+02	1.41E+00
K Dash Traditional Fine Mortar	1.29E+02	1.41E+03	2.21E+03	1.19E+02	8.98E-01
HP Dash Receiver	1.80E+02	2.19E+03	3.54E+03	1.46E+02	1.64E+00
Comrend	1.62E+02	1.85E+03	3.18E+03	1.36E+02	1.16E+00
Silicone Dash Receiver	1.63E+02	1.86E+03	3.34E+03	1.57E+02	1.31E+00
Silicone FT	1.73E+02	2.05E+03	3.46E+03	1.51E+02	1.52E+00
Silicone K1	1.68E+02	2.17E+3	3.59E+03	1.57E+02	1.36E+00
Overcoating Silicone Dash Receiver	3.18E+02	4.39E+03	8.18E+03	6.73E+02	3.65E+00
Standard Dash Receiver	1.60E+02	1.79E+03	3.29E+03	1.55E+02	1.10E+00

LCA Results - 1 tonne of K1 Spray+

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	1.51E+02	1.50E+02	1.29E+00	4.66E-02	1.67E-05	4.87E-01	2.60E-02
	Transport	A2	7.93E+00	7.92E+00	4.95E-03	3.96E-03	1.75E-06	9.83E-02	4.58E-04
	Manufacturing	A3	3.85E+00	3.77E+01	-3.39E+01	5.25E-02	4.02E-06	1.29E-01	5.01E-03
	Total (Consumption grid)	A1-3	1.63E+02	1.95E+02	-3.26E+01	1.03E-01	2.24E-05	7.15E-01	3.14E-02
Construction process stage	Transport	A4	1.71E+01	1.71E+01	1.41E-02	6.87E-03	3.94E-06	8.28E-02	1.09E-03
	Construction	A5	6.99E+00	8.24E+00	-1.26E+00	4.56E-03	1.08E-06	3.18E-02	3.47E-03
90%- Recycling and 10% to landfill									
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	8.32E+00	8.31E+00	7.08E-03	3.26E-03	1.92E-06	3.37E-02	5.35E-04
	Waste processing	C3	3.62E+00	3.62E+00	1.28E-03	3.61E-04	7.73E-07	3.76E-02	1.12E-04
	Disposal	C4	5.28E-01	5.27E-01	5.22E-04	4.97E-04	2.13E-07	4.95E-03	4.82E-05
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	-7.58E+00	-7.47E+00	-9.67E-02	-1.05E-02	-6.02E-07	-4.81E-02	-4.07E-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)

Parameters describing environmental impacts									
			EP-marine	EP-terrestrial	POCP	ADP-mineral &metals	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	1.01E-01	1.10E+00	3.04E-01	7.49E-04	1.10E+03	4.76E+01	3.94E-06
	Transport	A2	2.55E-02	2.82E-01	7.66E-02	2.35E-05	1.14E+02	4.65E-01	5.57E-07
	Manufacturing	A3	4.80E-02	4.92E-01	1.44E-01	1.56E-04	7.55E+02	9.07E+00	2.54E-06
	Total (Consumption grid)	A1-3	1.75E-01	1.87E+00	5.24E-01	9.29E-04	1.97E+03	5.71E+01	7.04E-06
Construction process stage	Transport	A4	2.41E-02	2.64E-01	7.88E-02	5.84E-05	2.57E+02	1.14E+00	1.45E-06
	Construction	A5	7.94E-03	8.52E-02	2.40E-02	3.90E-05	9.07E+01	1.32E+01	3.37E-07
90%- Recycling and 10% to landfill									
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	1.02E-02	1.11E-01	3.40E-02	2.89E-05	1.26E+02	5.65E-01	7.17E-07
	Waste processing	C3	1.66E-02	1.82E-01	5.01E-02	1.86E-06	4.96E+01	1.15E-01	7.70E-06
	Disposal	C4	1.72E-03	1.88E-02	5.48E-03	1.20E-06	1.47E+01	6.74E-01	9.97E-08
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	-1.11E-02	-1.33E-01	-3.44E-02	-7.06E-05	-1.10E+02	-1.44E+01	-6.07E-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)

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	7.60E+00	2.60E+03	9.28E-08	2.04E-06	2.99E+02
	Transport	A2	5.76E-01	8.46E+01	3.66E-09	8.16E-08	6.19E+01
	Manufacturing	A3	1.21E+01	5.05E+02	5.51E-08	3.30E-07	3.20E+03
	Total (Consumption grid)	A1-3	2.03E+01	3.19E+03	1.52E-07	2.45E-06	3.56E+03
Construction process stage	Transport	A4	1.32E+00	2.00E+02	6.63E-09	2.08E-07	1.73E+02
	Construction	A5	8.91E-01	2.46E+02	1.65E-08	4.52E-07	1.81E+02
90%- Recycling and 10% to landfill							
End of life	Deconstruction, demolition	C1	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Transport	C2	6.46E-01	9.81E+01	3.18E-09	1.03E-07	8.63E+01
	Waste processing	C3	2.24E-01	2.90E+01	1.12E-09	2.10E-08	6.32E+00
	Disposal	C4	6.53E-02	9.29E+00	2.36E-10	6.11E-09	3.09E+01
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	-1.70E+00	-1.27E+02	-7.39E-09	-1.34E-07	-1.01E+02

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)

Parameters describing resource use, primary energy								
			PERE	PERM	PERT	PENRE	PENRM	PENRT
			MJ	MJ	MJ	MJ	MJ	MJ
Product stage	Raw material supply	A1	9.82E+01	1.06E+01	1.09E+02	1.54E+03	1.05E+02	1.65E+03
	Transport	A2	1.40E+00	0.00E+00	1.40E+00	1.12E+02	0.00E+00	1.12E+02
	Manufacturing	A3	3.10E+02	3.40E+02	6.50E+02	8.39E+02	2.93E+01	8.68E+02
	Total (Consumption grid)	A1-3	4.10E+02	3.51E+02	7.61E+02	2.49E+03	1.35E+02	2.63E+03
Construction process stage	Transport	A4	3.58E+00	0.00E+00	3.58E+00	2.53E+02	0.00E+00	2.53E+02
	Construction	A5	1.63E+01	1.44E+01	3.07E+01	1.02E+02	5.39E+00	1.08E+02
90%- Recycling and 10% to landfill								
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	1.77E+00	0.00E+00	1.77E+00	1.23E+02	0.00E+00	1.23E+02
	Waste processing	C3	2.78E-01	0.00E+00	2.78E-01	4.87E+01	0.00E+00	4.87E+01
	Disposal	C4	1.25E-01	0.00E+00	1.25E-01	1.44E+01	0.00E+00	1.44E+01
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	-1.03E+01	0.00E+00	-1.03E+01	-1.10E+02	0.00E+00	-1.10E+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)

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	8.41E-03	0.00E+00	0.00E+00	1.14E+00
	Transport	A2	0.00E+00	0.00E+00	0.00E+00	1.15E-02
	Manufacturing	A3	1.31E+00	2.79E-04	0.00E+00	2.68E-01
	Total (Consumption grid)	A1-3	1.32E+00	2.79E-04	0.00E+00	1.41E+00
Construction process stage	Transport	A4	0.00E+00	0.00E+00	0.00E+00	2.84E-02
	Construction	A5	5.29E-02	1.12E-05	0.00E+00	3.10E-01
90%- Recycling and 10% to landfill						
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	1.40E-02
	Waste processing	C3	0.00E+00	0.00E+00	0.00E+00	2.83E-03
	Disposal	C4	0.00E+00	0.00E+00	0.00E+00	1.58E-02
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	0.00E+00	0.00E+00	0.00E+00	-3.39E-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)

Other environmental information describing waste categories					
			HWD	NHWD	RWD
			kg	kg	kg
Product stage	Raw material supply	A1	7.41E+00	1.28E+02	3.57E-03
	Transport	A2	1.33E-01	1.99E+00	6.66E+00
	Manufacturing	A3	1.38E+00	2.15E+01	4.29E-03
	Total (Consumption grid)	A1-3	8.92E+00	1.51E+02	6.67E+00
Construction process stage	Transport	A4	2.85E-01	4.99E+00	1.74E-03
	Construction	A5	3.77E-01	6.55E+00	2.67E-01
90%- Recycling and 10% to landfill					
End of life	Deconstruction, demolition	C1	0.00E+00	0.00E+00	0.00E+00
	Transport	C2	1.39E-01	2.46E+00	8.50E-04
	Waste processing	C3	6.51E-02	4.57E-01	3.43E-04
	Disposal	C4	1.53E-02	2.16E-01	9.64E-05
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	-6.33E-01	-1.93E+01	-5.62E-04

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

LCA Results (continued)

	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	1.22E-01	2.62E-06	2.35E-01	6.26E-02	-1.02E+01
	Total (Consumption grid)	A1-3	0.00E+00	1.22E-01	2.62E-06	2.35E-01	6.26E-02	-1.02E+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	5.84E-03	1.73E-04	9.39E-03	2.72E-03	-4.08E-01
90%- Recycling and 10% to landfill								
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	6.48E-05	1.04E-06	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

LCA Results - 1 tonne of K Dash Traditional Fine Mortar

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	1.18E+02	1.17E+02	1.28E+00	2.47E-02	4.80E-06	4.91E-01	1.34E-02
	Transport	A2	5.80E+00	5.79E+00	3.28E-03	2.90E-03	1.28E-06	7.49E-02	3.22E-04
	Manufacturing	A3	4.62E+00	3.85E+01	-3.39E+01	5.28E-02	4.08E-06	1.30E-01	5.05E-03
	Total (Consumption grid)	A1-3	1.29E+02	1.61E+02	-3.27E+01	8.04E-02	1.02E-05	6.96E-01	1.88E-02
Construction process stage	Transport	A4	1.71E+01	1.71E+01	1.41E-02	6.87E-03	3.94E-06	8.28E-02	1.09E-03
	Construction	A5	5.62E+00	6.88E+00	-1.26E+00	3.66E-03	5.87E-07	3.10E-02	2.97E-03
90%- Recycling and 10% to landfill									
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	8.32E+00	8.31E+00	7.08E-03	3.26E-03	1.92E-06	3.37E-02	5.35E-04
	Waste processing	C3	3.62E+00	3.62E+00	1.28E-03	3.61E-04	7.73E-07	3.76E-02	1.12E-04
	Disposal	C4	5.28E-01	5.27E-01	5.22E-04	4.97E-04	2.13E-07	4.95E-03	4.82E-05
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	-7.58E+00	-7.47E+00	-9.67E-02	-1.05E-02	-6.02E-07	-4.81E-02	-4.07E-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)

Parameters describing environmental impacts									
			EP-marine	EP-terrestrial	POCP	ADP-mineral &metals	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	7.46E-02	8.14E-01	2.24E-01	2.47E-04	5.56E+02	2.60E+01	2.08E-06
	Transport	A2	1.93E-02	2.14E-01	5.80E-02	1.71E-05	8.33E+01	3.28E-01	4.02E-07
	Manufacturing	A3	4.83E-02	4.95E-01	1.45E-01	1.58E-04	7.70E+02	9.09E+00	2.55E-06
	Total (Consumption grid)	A1-3	1.42E-01	1.52E+00	4.27E-01	4.22E-04	1.41E+03	3.54E+01	5.03E-06
Construction process stage	Transport	A4	2.41E-02	2.64E-01	7.88E-02	5.84E-05	2.57E+02	1.14E+00	1.45E-06
	Construction	A5	6.65E-03	7.12E-02	2.01E-02	1.87E-05	6.84E+01	1.23E+01	2.57E-07
90%- Recycling and 10% to landfill									
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	1.02E-02	1.11E-01	3.40E-02	2.89E-05	1.26E+02	5.65E-01	7.17E-07
	Waste processing	C3	1.66E-02	1.82E-01	5.01E-02	1.86E-06	4.96E+01	1.15E-01	7.70E-06
	Disposal	C4	1.72E-03	1.88E-02	5.48E-03	1.20E-06	1.47E+01	6.74E-01	9.97E-08
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	-1.11E-02	-1.33E-01	-3.44E-02	-7.06E-05	-1.10E+02	-1.44E+01	-6.07E-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)

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	5.25E+00	9.72E+02	5.21E-08	9.77E-07	2.15E+02
	Transport	A2	4.15E-01	6.14E+01	2.70E-09	5.89E-08	4.43E+01
	Manufacturing	A3	1.24E+01	5.09E+02	5.53E-08	3.33E-07	3.20E+03
	Total (Consumption grid)	A1-3	1.80E+01	1.54E+03	1.10E-07	1.37E-06	3.46E+03
Construction process stage	Transport	A4	1.32E+00	2.00E+02	6.63E-09	2.08E-07	1.73E+02
	Construction	A5	8.01E-01	1.80E+02	1.48E-08	4.08E-07	1.77E+02
90%- Recycling and 10% to landfill							
End of life	Deconstruction, demolition	C1	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Transport	C2	6.46E-01	9.81E+01	3.18E-09	1.03E-07	8.63E+01
	Waste processing	C3	2.24E-01	2.90E+01	1.12E-09	2.10E-08	6.32E+00
	Disposal	C4	6.53E-02	9.29E+00	2.36E-10	6.11E-09	3.09E+01
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	-1.70E+00	-1.27E+02	-7.39E-09	-1.34E-07	-1.01E+02

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)

Parameters describing resource use, primary energy								
			PERE	PERM	PERT	PENRE	PENRM	PENRT
			MJ	MJ	MJ	MJ	MJ	MJ
Product stage	Raw material supply	A1	4.03E+01	8.90E+00	4.92E+01	5.36E+02	2.97E+00	5.39E+02
	Transport	A2	1.02E+00	0.00E+00	1.02E+00	8.18E+01	0.00E+00	8.18E+01
	Manufacturing	A3	3.12E+02	3.40E+02	6.52E+02	8.58E+02	2.93E+01	8.87E+02
	Total (Consumption grid)	A1-3	3.53E+02	3.49E+02	7.02E+02	1.48E+03	3.23E+01	1.51E+03
Construction process stage	Transport	A4	3.58E+00	0.00E+00	3.58E+00	2.53E+02	0.00E+00	2.53E+02
	Construction	A5	1.40E+01	1.43E+01	2.84E+01	6.16E+01	1.30E+00	6.29E+01
90%- Recycling and 10% to landfill								
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	1.77E+00	0.00E+00	1.77E+00	1.23E+02	0.00E+00	1.23E+02
	Waste processing	C3	2.78E-01	0.00E+00	2.78E-01	4.87E+01	0.00E+00	4.87E+01
	Disposal	C4	1.25E-01	0.00E+00	1.25E-01	1.44E+01	0.00E+00	1.44E+01
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	-1.03E+01	0.00E+00	-1.03E+01	-1.10E+02	0.00E+00	-1.10E+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)

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	0.00E+00	0.00E+00	0.00E+00	6.20E-01
	Transport	A2	0.00E+00	0.00E+00	0.00E+00	8.13E-03
	Manufacturing	A3	1.31E+00	2.86E-04	0.00E+00	2.70E-01
	Total (Consumption grid)	A1-3	1.31E+00	2.86E-04	0.00E+00	8.98E-01
Construction process stage	Transport	A4	0.00E+00	0.00E+00	0.00E+00	2.84E-02
	Construction	A5	5.26E-02	1.14E-05	0.00E+00	2.90E-01
90%- Recycling and 10% to landfill						
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	1.40E-02
	Waste processing	C3	0.00E+00	0.00E+00	0.00E+00	2.83E-03
	Disposal	C4	0.00E+00	0.00E+00	0.00E+00	1.58E-02
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	0.00E+00	0.00E+00	0.00E+00	-3.39E-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)

Other environmental information describing waste categories					
			HWD	NHWD	RWD
			kg	kg	kg
Product stage	Raw material supply	A1	3.71E+00	8.36E+01	2.73E-03
	Transport	A2	9.83E-02	1.46E+00	6.66E+00
	Manufacturing	A3	1.39E+00	2.17E+01	4.37E-03
	Total (Consumption grid)	A1-3	5.20E+00	1.07E+02	6.67E+00
Construction process stage	Transport	A4	2.85E-01	4.99E+00	1.74E-03
	Construction	A5	2.28E-01	4.76E+00	2.67E-01
90%- Recycling and 10% to landfill					
End of life	Deconstruction, demolition	C1	0.00E+00	0.00E+00	0.00E+00
	Transport	C2	1.39E-01	2.46E+00	8.50E-04
	Waste processing	C3	6.51E-02	4.57E-01	3.43E-04
	Disposal	C4	1.53E-02	2.16E-01	9.64E-05
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	-6.33E-01	-1.93E+01	-5.62E-04

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

LCA Results (continued)

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	1.22E-01	2.69E-06	2.40E-01	6.26E-02	-1.02E+01
	Total (Consumption grid)	A1-3	0.00E+00	1.22E-01	2.69E-06	2.40E-01	6.26E-02	-1.02E+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	5.84E-03	2.00E-04	9.62E-03	2.72E-03	-4.08E-01
90%- Recycling and 10% to landfill								
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	6.48E-05	1.04E-06	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

LCA Results - 1 tonne of HP Dash Receiver

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	1.69E+02	1.67E+02	2.23E+00	4.40E-02	1.55E-05	5.10E-01	2.68E-02
	Transport	A2	7.53E+00	7.52E+00	4.75E-03	3.58E-03	1.68E-06	8.22E-02	4.33E-04
	Manufacturing	A3	3.85E+00	3.77E+01	-3.39E+01	5.25E-02	4.02E-06	1.29E-01	5.01E-03
	Total (Consumption grid)	A1-3	1.80E+02	2.12E+02	-3.17E+01	1.00E-01	2.12E-05	7.21E-01	3.22E-02
Construction process stage	Transport	A4	1.71E+01	1.71E+01	1.41E-02	6.87E-03	3.94E-06	8.28E-02	1.09E-03
	Construction	A5	7.69E+00	8.90E+00	-1.22E+00	4.45E-03	1.03E-06	3.20E-02	3.51E-03
90%- Recycling and 10% to landfill									
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	8.32E+00	8.31E+00	7.08E-03	3.26E-03	1.92E-06	3.37E-02	5.35E-04
	Waste processing	C3	3.62E+00	3.62E+00	1.28E-03	3.61E-04	7.73E-07	3.76E-02	1.12E-04
	Disposal	C4	5.28E-01	5.27E-01	5.22E-04	4.97E-04	2.13E-07	4.95E-03	4.82E-05
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	-7.58E+00	-7.47E+00	-9.67E-02	-1.05E-02	-6.02E-07	-4.81E-02	-4.07E-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)

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	1.22E-01	1.22E+00	3.55E-01	2.20E-03	1.33E+03	5.75E+01	5.57E-06
	Transport	A2	2.15E-02	2.38E-01	6.52E-02	2.31E-05	1.09E+02	4.46E-01	5.51E-07
	Manufacturing	A3	4.80E-02	4.92E-01	1.44E-01	1.56E-04	7.55E+02	9.07E+00	2.54E-06
	Total (Consumption grid)	A1-3	1.91E-01	1.95E+00	5.65E-01	2.38E-03	2.19E+03	6.70E+01	8.67E-06
Construction process stage	Transport	A4	2.41E-02	2.64E-01	7.88E-02	5.84E-05	2.57E+02	1.14E+00	1.45E-06
	Construction	A5	8.61E-03	8.82E-02	2.56E-02	9.70E-05	9.98E+01	1.36E+01	4.02E-07
90%- Recycling and 10% to landfill									
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	1.02E-02	1.11E-01	3.40E-02	2.89E-05	1.26E+02	5.65E-01	7.17E-07
	Waste processing	C3	1.66E-02	1.82E-01	5.01E-02	1.86E-06	4.96E+01	1.15E-01	7.70E-06
	Disposal	C4	1.72E-03	1.88E-02	5.48E-03	1.20E-06	1.47E+01	6.74E-01	9.97E-08
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	-1.11E-02	-1.33E-01	-3.44E-02	-7.06E-05	-1.10E+02	-1.44E+01	-6.07E-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)

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	7.66E+00	3.74E+03	1.20E-07	2.78E-06	2.22E+02
	Transport	A2	5.49E-01	8.18E+01	3.36E-09	8.03E-08	6.22E+01
	Manufacturing	A3	1.21E+01	5.05E+02	5.51E-08	3.30E-07	3.20E+03
	Total (Consumption grid)	A1-3	2.03E+01	4.33E+03	1.78E-07	3.19E-06	3.49E+03
Construction process stage	Transport	A4	1.32E+00	2.00E+02	6.63E-09	2.08E-07	1.73E+02
	Construction	A5	8.93E-01	2.91E+02	1.75E-08	4.81E-07	1.78E+02
90%- Recycling and 10% to landfill							
End of life	Deconstruction, demolition	C1	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Transport	C2	6.46E-01	9.81E+01	3.18E-09	1.03E-07	8.63E+01
	Waste processing	C3	2.24E-01	2.90E+01	1.12E-09	2.10E-08	6.32E+00
	Disposal	C4	6.53E-02	9.29E+00	2.36E-10	6.11E-09	3.09E+01
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	-1.70E+00	-1.27E+02	-7.39E-09	-1.34E-07	-1.01E+02

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)

Parameters describing resource use, primary energy								
			PERE	PERM	PERT	PENRE	PENRM	PENRT
			MJ	MJ	MJ	MJ	MJ	MJ
Product stage	Raw material supply	A1	1.03E+02	4.60E+00	1.07E+02	1.59E+03	2.11E+02	1.80E+03
	Transport	A2	1.39E+00	0.00E+00	1.39E+00	1.07E+02	0.00E+00	1.07E+02
	Manufacturing	A3	3.10E+02	3.40E+02	6.50E+02	8.39E+02	2.93E+01	8.68E+02
	Total (Consumption grid)	A1-3	4.14E+02	3.45E+02	7.59E+02	2.54E+03	2.41E+02	2.78E+03
Construction process stage	Transport	A4	3.58E+00	0.00E+00	3.58E+00	2.53E+02	0.00E+00	2.53E+02
	Construction	A5	1.65E+01	1.42E+01	3.06E+01	1.04E+02	9.63E+00	1.14E+02
90%- Recycling and 10% to landfill								
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	1.77E+00	0.00E+00	1.77E+00	1.23E+02	0.00E+00	1.23E+02
	Waste processing	C3	2.78E-01	0.00E+00	2.78E-01	4.87E+01	0.00E+00	4.87E+01
	Disposal	C4	1.25E-01	0.00E+00	1.25E-01	1.44E+01	0.00E+00	1.44E+01
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	-1.03E+01	0.00E+00	-1.03E+01	-1.10E+02	0.00E+00	-1.10E+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)

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	6.87E-02	0.00E+00	0.00E+00	1.36E+00
	Transport	A2	0.00E+00	0.00E+00	0.00E+00	1.10E-02
	Manufacturing	A3	1.31E+00	2.79E-04	0.00E+00	2.68E-01
	Total (Consumption grid)	A1-3	1.38E+00	2.79E-04	0.00E+00	1.64E+00
Construction process stage	Transport	A4	0.00E+00	0.00E+00	0.00E+00	2.84E-02
	Construction	A5	5.53E-02	1.12E-05	0.00E+00	3.19E-01
90%- Recycling and 10% to landfill						
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	1.40E-02
	Waste processing	C3	0.00E+00	0.00E+00	0.00E+00	2.83E-03
	Disposal	C4	0.00E+00	0.00E+00	0.00E+00	1.58E-02
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	0.00E+00	0.00E+00	0.00E+00	-3.39E-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)

Other environmental information describing waste categories					
			HWD	NHWD	RWD
			kg	kg	kg
Product stage	Raw material supply	A1	5.29E+00	1.09E+02	3.62E-03
	Transport	A2	1.27E-01	1.97E+00	6.66E+00
	Manufacturing	A3	1.38E+00	2.15E+01	4.29E-03
	Total (Consumption grid)	A1-3	6.80E+00	1.33E+02	6.67E+00
Construction process stage	Transport	A4	2.85E-01	4.99E+00	1.74E-03
	Construction	A5	2.92E-01	5.80E+00	2.67E-01
90%- Recycling and 10% to landfill					
End of life	Deconstruction, demolition	C1	0.00E+00	0.00E+00	0.00E+00
	Transport	C2	1.38E-01	2.46E+00	8.50E-04
	Waste processing	C3	6.51E-02	4.57E-01	3.43E-04
	Disposal	C4	1.53E-02	2.16E-01	9.64E-05
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	-6.33E-01	-1.93E+01	-5.62E-04

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

LCA Results (continued)

	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	1.22E-01	2.62E-06	2.35E-01	6.26E-02	-1.02E+01
	Total (Consumption grid)	A1-3	0.00E+00	1.22E-01	2.62E-06	2.35E-01	6.26E-02	-1.02E+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	5.84E-03	1.10E-04	9.39E-03	2.72E-03	-4.08E-01
90%- Recycling and 10% to landfill								
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	6.48E-05	1.04E-06	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

LCA Results - 1 tonne of Comrend

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	1.50E+02	1.48E+02	1.56E+00	3.45E-02	7.89E-06	4.04E-01	2.16E-02
	Transport	A2	7.99E+00	7.98E+00	4.20E-03	4.09E-03	1.75E-06	1.11E-01	4.32E-04
	Manufacturing	A3	3.84E+00	3.77E+01	-3.39E+01	5.25E-02	4.02E-06	1.29E-01	5.00E-03
	Total (Consumption grid)	A1-3	1.62E+02	1.94E+02	-3.24E+01	9.11E-02	1.37E-05	6.45E-01	2.70E-02
Construction process stage	Transport	A4	1.71E+01	1.71E+01	1.41E-02	6.87E-03	3.94E-06	8.28E-02	1.09E-03
	Construction	A5	6.94E+00	8.19E+00	-1.25E+00	4.09E-03	7.27E-07	2.90E-02	3.30E-03
90%- Recycling and 10% to landfill									
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	8.32E+00	8.31E+00	7.08E-03	3.26E-03	1.92E-06	3.37E-02	5.35E-04
	Waste processing	C3	3.62E+00	3.62E+00	1.28E-03	3.61E-04	7.73E-07	3.76E-02	1.12E-04
	Disposal	C4	5.28E-01	5.27E-01	5.22E-04	4.97E-04	2.13E-07	4.95E-03	4.82E-05
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	-7.58E+00	-7.47E+00	-9.67E-02	-1.05E-02	-6.02E-07	-4.81E-02	-4.07E-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)

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	9.56E-02	1.01E+00	2.84E-01	3.70E-04	9.85E+02	3.66E+01	3.40E-06
	Transport	A2	2.86E-02	3.17E-01	8.53E-02	2.27E-05	1.14E+02	4.40E-01	5.37E-07
	Manufacturing	A3	4.78E-02	4.91E-01	1.44E-01	1.56E-04	7.55E+02	9.43E+00	2.54E-06
	Total (Consumption grid)	A1-3	1.72E-01	1.82E+00	5.13E-01	5.49E-04	1.85E+03	4.65E+01	6.48E-06
Construction process stage	Transport	A4	2.41E-02	2.64E-01	7.88E-02	5.84E-05	2.57E+02	1.14E+00	1.45E-06
	Construction	A5	7.84E-03	8.30E-02	2.36E-02	2.38E-05	8.62E+01	1.27E+01	3.15E-07
90%- Recycling and 10% to landfill									
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	1.02E-02	1.11E-01	3.40E-02	2.89E-05	1.26E+02	5.65E-01	7.17E-07
	Waste processing	C3	1.66E-02	1.82E-01	5.01E-02	1.86E-06	4.96E+01	1.15E-01	7.70E-06
	Disposal	C4	1.72E-03	1.88E-02	5.48E-03	1.20E-06	1.47E+01	6.74E-01	9.97E-08
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	-1.11E-02	-1.33E-01	-3.44E-02	-7.06E-05	-1.10E+02	-1.44E+01	-6.07E-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)

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	7.05E+00	2.58E+03	7.55E-08	1.76E-06	2.26E+02
	Transport	A2	5.66E-01	8.33E+01	3.75E-09	7.89E-08	5.85E+01
	Manufacturing	A3	1.21E+01	5.02E+02	5.51E-08	3.29E-07	3.20E+03
	Total (Consumption grid)	A1-3	1.97E+01	3.17E+03	1.34E-07	2.17E-06	3.49E+03
Construction process stage	Transport	A4	1.32E+00	2.00E+02	6.63E-09	2.08E-07	1.73E+02
	Construction	A5	8.69E-01	2.45E+02	1.58E-08	4.40E-07	1.78E+02
90%- Recycling and 10% to landfill							
End of life	Deconstruction, demolition	C1	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Transport	C2	6.46E-01	9.81E+01	3.18E-09	1.03E-07	8.63E+01
	Waste processing	C3	2.24E-01	2.90E+01	1.12E-09	2.10E-08	6.32E+00
	Disposal	C4	6.53E-02	9.29E+00	2.36E-10	6.11E-09	3.09E+01
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	-1.70E+00	-1.27E+02	-7.39E-09	-1.34E-07	-1.01E+02

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)

Parameters describing resource use, primary energy								
			PERE	PERM	PERT	PENRE	PENRM	PENRT
			MJ	MJ	MJ	MJ	MJ	MJ
Product stage	Raw material supply	A1	8.50E+01	8.54E+00	9.35E+01	1.35E+03	9.92E+01	1.45E+03
	Transport	A2	1.36E+00	0.00E+00	1.36E+00	1.12E+02	0.00E+00	1.12E+02
	Manufacturing	A3	3.10E+02	3.40E+02	6.50E+02	8.39E+02	2.93E+01	8.68E+02
	Total (Consumption grid)	A1-3	3.96E+02	3.49E+02	7.45E+02	2.30E+03	1.29E+02	2.43E+03
Construction process stage	Transport	A4	3.58E+00	0.00E+00	3.58E+00	2.53E+02	0.00E+00	2.53E+02
	Construction	A5	1.58E+01	1.43E+01	3.01E+01	9.46E+01	5.15E+00	9.97E+01
90%- Recycling and 10% to landfill								
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	1.77E+00	0.00E+00	1.77E+00	1.23E+02	0.00E+00	1.23E+02
	Waste processing	C3	2.78E-01	0.00E+00	2.78E-01	4.87E+01	0.00E+00	4.87E+01
	Disposal	C4	1.25E-01	0.00E+00	1.25E-01	1.44E+01	0.00E+00	1.44E+01
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	-1.03E+01	0.00E+00	-1.03E+01	-1.10E+02	0.00E+00	-1.10E+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)

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	1.01E-02	0.00E+00	0.00E+00	8.76E-01
	Transport	A2	0.00E+00	0.00E+00	0.00E+00	1.09E-02
	Manufacturing	A3	1.31E+00	2.79E-04	0.00E+00	2.76E-01
	Total (Consumption grid)	A1-3	1.32E+00	2.79E-04	0.00E+00	1.16E+00
Construction process stage	Transport	A4	0.00E+00	0.00E+00	0.00E+00	2.84E-02
	Construction	A5	5.29E-02	1.12E-05	0.00E+00	3.00E-01
90%- Recycling and 10% to landfill						
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	1.40E-02
	Waste processing	C3	0.00E+00	0.00E+00	0.00E+00	2.83E-03
	Disposal	C4	0.00E+00	0.00E+00	0.00E+00	1.58E-02
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	0.00E+00	0.00E+00	0.00E+00	-3.39E-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)

Other environmental information describing waste categories					
			HWD	NHWD	RWD
			kg	kg	kg
Product stage	Raw material supply	A1	7.32E+00	9.69E+01	3.39E-03
	Transport	A2	1.35E-01	1.95E+00	6.66E+00
	Manufacturing	A3	1.38E+00	2.15E+01	4.29E-03
	Total (Consumption grid)	A1-3	8.84E+00	1.20E+02	6.67E+00
Construction process stage	Transport	A4	2.85E-01	4.99E+00	1.74E-03
	Construction	A5	3.73E-01	5.31E+00	2.67E-01
90%- Recycling and 10% to landfill					
End of life	Deconstruction, demolition	C1	0.00E+00	0.00E+00	0.00E+00
	Transport	C2	1.39E-01	2.46E+00	8.50E-04
	Waste processing	C3	6.51E-02	4.57E-01	3.43E-04
	Disposal	C4	1.53E-02	2.16E-01	9.64E-05
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	-6.33E-01	-1.93E+01	-5.62E-04

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

LCA Results (continued)

	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	1.22E-01	2.62E-06	2.35E-01	6.26E-02	-1.02E+01
	Total (Consumption grid)	A1-3	0.00E+00	1.22E-01	2.62E-06	2.35E-01	6.26E-02	-1.02E+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	5.83E-03	1.10E-04	9.39E-03	2.72E-03	-4.08E-01
90%- Recycling and 10% to landfill								
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	6.48E-05	1.04E-06	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

LCA Results - 1 tonne of Silicone Dash Receiver

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	1.52E+02	1.50E+02	1.45E+00	4.26E-02	1.92E-05	4.31E-01	2.51E-02
	Transport	A2	7.19E+00	7.18E+00	4.41E-03	3.46E-03	1.60E-06	8.21E-02	4.10E-04
	Manufacturing	A3	3.85E+00	3.77E+01	-3.39E+01	5.25E-02	4.02E-06	1.29E-01	5.01E-03
	Total (Consumption grid)	A1-3	1.63E+02	1.95E+02	-3.25E+01	9.86E-02	2.48E-05	6.42E-01	3.05E-02
Construction process stage	Transport	A4	1.71E+01	1.71E+01	1.41E-02	6.87E-03	3.94E-06	8.28E-02	1.09E-03
	Construction	A5	6.99E+00	8.24E+00	-1.25E+00	4.39E-03	1.17E-06	2.89E-02	3.44E-03
90%- Recycling and 10% to landfill									
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	8.32E+00	8.31E+00	7.08E-03	3.26E-03	1.92E-06	3.37E-02	5.35E-04
	Waste processing	C3	3.62E+00	3.62E+00	1.28E-03	3.61E-04	7.73E-07	3.76E-02	1.12E-04
	Disposal	C4	5.28E-01	5.27E-01	5.22E-04	4.97E-04	2.13E-07	4.95E-03	4.82E-05
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	-7.58E+00	-7.47E+00	-9.67E-02	-1.05E-02	-6.02E-07	-4.81E-02	-4.07E-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)

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	9.39E-02	1.05E+00	2.89E-01	5.33E-04	9.97E+02	4.31E+01	2.65E-06
	Transport	A2	2.14E-02	2.36E-01	6.46E-02	2.19E-05	1.04E+02	4.21E-01	5.19E-07
	Manufacturing	A3	4.80E-02	4.91E-01	1.44E-01	1.56E-04	7.55E+02	9.07E+00	2.54E-06
	Total (Consumption grid)	A1-3	1.63E-01	1.78E+00	4.98E-01	7.11E-04	1.86E+03	5.26E+01	5.72E-06
Construction process stage	Transport	A4	2.41E-02	2.64E-01	7.88E-02	5.84E-05	2.57E+02	1.14E+00	1.45E-06
	Construction	A5	7.49E-03	8.13E-02	2.30E-02	3.03E-05	8.63E+01	1.30E+01	2.84E-07
90%- Recycling and 10% to landfill									
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	1.02E-02	1.11E-01	3.40E-02	2.89E-05	1.26E+02	5.65E-01	7.17E-07
	Waste processing	C3	1.66E-02	1.82E-01	5.01E-02	1.86E-06	4.96E+01	1.15E-01	7.70E-06
	Disposal	C4	1.72E-03	1.88E-02	5.48E-03	1.20E-06	1.47E+01	6.74E-01	9.97E-08
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	-1.11E-02	-1.33E-01	-3.44E-02	-7.06E-05	-1.10E+02	-1.44E+01	-6.07E-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)

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	8.06E+00	1.44E+03	6.98E-08	1.61E-06	2.69E+02
	Transport	A2	5.22E-01	7.76E+01	3.24E-09	7.58E-08	5.83E+01
	Manufacturing	A3	1.21E+01	5.05E+02	5.51E-08	3.30E-07	3.20E+03
	Total (Consumption grid)	A1-3	2.07E+01	2.02E+03	1.28E-07	2.01E-06	3.53E+03
Construction process stage	Transport	A4	1.32E+00	2.00E+02	6.63E-09	2.08E-07	1.73E+02
	Construction	A5	9.07E-01	1.99E+02	1.55E-08	4.34E-07	1.80E+02
90%- Recycling and 10% to landfill							
End of life	Deconstruction, demolition	C1	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Transport	C2	6.46E-01	9.81E+01	3.18E-09	1.03E-07	8.63E+01
	Waste processing	C3	2.24E-01	2.90E+01	1.12E-09	2.10E-08	6.32E+00
	Disposal	C4	6.53E-02	9.29E+00	2.36E-10	6.11E-09	3.09E+01
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	-1.70E+00	-1.27E+02	-7.39E-09	-1.34E-07	-1.01E+02

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)

Parameters describing resource use, primary energy								
			PERE	PERM	PERT	PENRE	PENRM	PENRT
			MJ	MJ	MJ	MJ	MJ	MJ
Product stage	Raw material supply	A1	9.78E+01	1.04E+01	1.08E+02	1.56E+03	5.10E+01	1.61E+03
	Transport	A2	1.31E+00	0.00E+00	1.31E+00	1.02E+02	0.00E+00	1.02E+02
	Manufacturing	A3	3.10E+02	3.40E+02	6.50E+02	8.39E+02	2.93E+01	8.68E+02
	Total (Consumption grid)	A1-3	4.09E+02	3.51E+02	7.60E+02	2.50E+03	8.03E+01	2.58E+03
Construction process stage	Transport	A4	3.58E+00	0.00E+00	3.58E+00	2.53E+02	0.00E+00	2.53E+02
	Construction	A5	1.63E+01	1.44E+01	3.07E+01	1.03E+02	3.22E+00	1.06E+02
90%- Recycling and 10% to landfill								
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	1.77E+00	0.00E+00	1.77E+00	1.23E+02	0.00E+00	1.23E+02
	Waste processing	C3	2.78E-01	0.00E+00	2.78E-01	4.87E+01	0.00E+00	4.87E+01
	Disposal	C4	1.25E-01	0.00E+00	1.25E-01	1.44E+01	0.00E+00	1.44E+01
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	-1.03E+01	0.00E+00	-1.03E+01	-1.10E+02	0.00E+00	-1.10E+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)

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	0.00E+00	0.00E+00	0.00E+00	1.03E+00
	Transport	A2	0.00E+00	0.00E+00	0.00E+00	1.04E-02
	Manufacturing	A3	1.31E+00	2.79E-04	0.00E+00	2.68E-01
	Total (Consumption grid)	A1-3	1.31E+00	2.79E-04	0.00E+00	1.31E+00
Construction process stage	Transport	A4	0.00E+00	0.00E+00	0.00E+00	2.84E-02
	Construction	A5	5.25E-02	1.12E-05	0.00E+00	3.06E-01
90%- Recycling and 10% to landfill						
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	1.40E-02
	Waste processing	C3	0.00E+00	0.00E+00	0.00E+00	2.83E-03
	Disposal	C4	0.00E+00	0.00E+00	0.00E+00	1.58E-02
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	0.00E+00	0.00E+00	0.00E+00	-3.39E-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)

Other environmental information describing waste categories					
			HWD	NHWD	RWD
			kg	kg	kg
Product stage	Raw material supply	A1	4.07E+00	1.21E+02	3.69E-03
	Transport	A2	1.22E-01	1.86E+00	6.66E+00
	Manufacturing	A3	1.38E+00	2.15E+01	4.29E-03
	Total (Consumption grid)	A1-3	5.57E+00	1.45E+02	6.67E+00
Construction process stage	Transport	A4	2.85E-01	4.99E+00	1.74E-03
	Construction	A5	2.43E-01	6.29E+00	2.67E-01
90%- Recycling and 10% to landfill					
End of life	Deconstruction, demolition	C1	0.00E+00	0.00E+00	0.00E+00
	Transport	C2	1.39E-01	2.46E+00	8.50E-04
	Waste processing	C3	6.51E-02	4.57E-01	3.43E-04
	Disposal	C4	1.53E-02	2.16E-01	9.64E-05
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	-6.33E-01	-1.93E+01	-5.62E-04

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

LCA Results (continued)

	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	1.22E-01	2.62E-06	2.35E-01	6.26E-02	-1.02E+01
	Total (Consumption grid)	A1-3	0.00E+00	1.22E-01	2.62E-06	2.35E-01	6.26E-02	-1.02E+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	5.84E-03	1.73E-04	9.39E-03	2.72E-03	-4.08E-01
90%- Recycling and 10% to landfill								
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	6.48E-05	1.04E-06	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

LCA Results - 1 tonne of Silicone FT

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	1.61E+02	1.59E+02	2.03E+00	4.10E-02	1.93E-05	4.56E-01	2.47E-02
	Transport	A2	8.41E+00	8.40E+00	4.52E-03	4.26E-03	1.85E-06	1.14E-01	4.58E-04
	Manufacturing	A3	3.85E+00	3.77E+01	-3.39E+01	5.25E-02	4.02E-06	1.29E-01	5.01E-03
	Total (Consumption grid)	A1-3	1.73E+02	2.05E+02	-3.19E+01	9.77E-02	2.52E-05	6.99E-01	3.02E-02
Construction process stage	Transport	A4	1.71E+01	1.71E+01	1.41E-02	6.87E-03	3.94E-06	8.28E-02	1.09E-03
	Construction	A5	7.39E+00	8.61E+00	-1.23E+00	4.35E-03	1.19E-06	3.12E-02	3.43E-03
90%- Recycling and 10% to landfill									
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	8.32E+00	8.31E+00	7.08E-03	3.26E-03	1.92E-06	3.37E-02	5.35E-04
	Waste processing	C3	3.62E+00	3.62E+00	1.28E-03	3.61E-04	7.73E-07	3.76E-02	1.12E-04
	Disposal	C4	5.28E-01	5.27E-01	5.22E-04	4.97E-04	2.13E-07	4.95E-03	4.82E-05
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	-7.58E+00	-7.47E+00	-9.67E-02	-1.05E-02	-6.02E-07	-4.81E-02	-4.07E-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)

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	1.05E-01	1.11E+00	3.17E-01	4.45E-04	1.17E+03	5.21E+01	3.92E-06
	Transport	A2	2.94E-02	3.25E-01	8.77E-02	2.41E-05	1.20E+02	4.68E-01	5.71E-07
	Manufacturing	A3	4.80E-02	4.92E-01	1.44E-01	1.56E-04	7.55E+02	9.07E+00	2.54E-06
	Total (Consumption grid)	A1-3	1.82E-01	1.92E+00	5.49E-01	6.26E-04	2.05E+03	6.16E+01	7.03E-06
Construction process stage	Transport	A4	2.41E-02	2.64E-01	7.88E-02	5.84E-05	2.57E+02	1.14E+00	1.45E-06
	Construction	A5	8.25E-03	8.72E-02	2.50E-02	2.69E-05	9.38E+01	1.33E+01	3.37E-07
90%- Recycling and 10% to landfill									
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	1.02E-02	1.11E-01	3.40E-02	2.89E-05	1.26E+02	5.65E-01	7.17E-07
	Waste processing	C3	1.66E-02	1.82E-01	5.01E-02	1.86E-06	4.96E+01	1.15E-01	7.70E-06
	Disposal	C4	1.72E-03	1.88E-02	5.48E-03	1.20E-06	1.47E+01	6.74E-01	9.97E-08
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	-1.11E-02	-1.33E-01	-3.44E-02	-7.06E-05	-1.10E+02	-1.44E+01	-6.07E-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)

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	7.94E+00	2.79E+03	9.34E-08	1.92E-06	2.33E+02
	Transport	A2	5.98E-01	8.82E+01	3.92E-09	8.38E-08	6.26E+01
	Manufacturing	A3	1.21E+01	5.05E+02	5.51E-08	3.30E-07	3.20E+03
	Total (Consumption grid)	A1-3	2.07E+01	3.38E+03	1.52E-07	2.33E-06	3.50E+03
Construction process stage	Transport	A4	1.32E+00	2.00E+02	6.63E-09	2.08E-07	1.73E+02
	Construction	A5	9.06E-01	2.54E+02	1.65E-08	4.47E-07	1.79E+02
90%- Recycling and 10% to landfill							
End of life	Deconstruction, demolition	C1	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Transport	C2	6.46E-01	9.81E+01	3.18E-09	1.03E-07	8.63E+01
	Waste processing	C3	2.24E-01	2.90E+01	1.12E-09	2.10E-08	6.32E+00
	Disposal	C4	6.53E-02	9.29E+00	2.36E-10	6.11E-09	3.09E+01
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	-1.70E+00	-1.27E+02	-7.39E-09	-1.34E-07	-1.01E+02

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)

Parameters describing resource use, primary energy								
			PERE	PERM	PERT	PENRE	PENRM	PENRT
			MJ	MJ	MJ	MJ	MJ	MJ
Product stage	Raw material supply	A1	1.02E+02	4.28E+00	1.06E+02	1.60E+03	1.16E+02	1.72E+03
	Transport	A2	1.45E+00	0.00E+00	1.45E+00	1.18E+02	0.00E+00	1.18E+02
	Manufacturing	A3	3.10E+02	3.40E+02	6.50E+02	8.39E+02	2.93E+01	8.68E+02
	Total (Consumption grid)	A1-3	4.13E+02	3.45E+02	7.58E+02	2.56E+03	1.45E+02	2.70E+03
Construction process stage	Transport	A4	3.58E+00	0.00E+00	3.58E+00	2.53E+02	0.00E+00	2.53E+02
	Construction	A5	1.64E+01	1.42E+01	3.06E+01	1.05E+02	5.82E+00	1.11E+02
90%- Recycling and 10% to landfill								
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	1.77E+00	0.00E+00	1.77E+00	1.23E+02	0.00E+00	1.23E+02
	Waste processing	C3	2.78E-01	0.00E+00	2.78E-01	4.87E+01	0.00E+00	4.87E+01
	Disposal	C4	1.25E-01	0.00E+00	1.25E-01	1.44E+01	0.00E+00	1.44E+01
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	-1.03E+01	0.00E+00	-1.03E+01	-1.10E+02	0.00E+00	-1.10E+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)

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	1.01E-02	0.00E+00	0.00E+00	1.24E+00
	Transport	A2	0.00E+00	0.00E+00	0.00E+00	1.16E-02
	Manufacturing	A3	1.31E+00	2.79E-04	0.00E+00	2.68E-01
	Total (Consumption grid)	A1-3	1.32E+00	2.79E-04	0.00E+00	1.52E+00
Construction process stage	Transport	A4	0.00E+00	0.00E+00	0.00E+00	2.84E-02
	Construction	A5	5.29E-02	1.12E-05	0.00E+00	3.14E-01
90%- Recycling and 10% to landfill						
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	1.40E-02
	Waste processing	C3	0.00E+00	0.00E+00	0.00E+00	2.83E-03
	Disposal	C4	0.00E+00	0.00E+00	0.00E+00	1.58E-02
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	0.00E+00	0.00E+00	0.00E+00	-3.39E-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)

Other environmental information describing waste categories					
			HWD	NHWD	RWD
			kg	kg	kg
Product stage	Raw material supply	A1	8.04E+00	1.11E+02	3.64E-03
	Transport	A2	1.42E-01	2.07E+00	6.66E+00
	Manufacturing	A3	1.38E+00	2.15E+01	4.29E-03
	Total (Consumption grid)	A1-3	9.56E+00	1.35E+02	6.67E+00
Construction process stage	Transport	A4	2.85E-01	4.99E+00	1.74E-03
	Construction	A5	4.02E-01	5.89E+00	2.67E-01
90%- Recycling and 10% to landfill					
End of life	Deconstruction, demolition	C1	0.00E+00	0.00E+00	0.00E+00
	Transport	C2	1.39E-01	2.46E+00	8.50E-04
	Waste processing	C3	6.51E-02	4.57E-01	3.43E-04
	Disposal	C4	1.53E-02	2.16E-01	9.64E-05
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	-6.33E-01	-1.93E+01	-5.62E-04

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

LCA Results (continued)

	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	1.22E-01	2.62E-06	2.35E-01	6.26E-02	-1.02E+01
	Total (Consumption grid)	A1-3	0.00E+00	1.22E-01	2.62E-06	2.35E-01	6.26E-02	-1.02E+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	5.84E-03	1.73E-04	9.39E-03	2.72E-03	-4.08E-01
90%- Recycling and 10% to landfill								
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	6.48E-05	1.04E-06	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

LCA Results - 1 tonne of Silicone K1

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	1.55E+02	1.54E+02	1.59E+00	4.36E-02	1.93E-05	4.37E-01	2.48E-02
	Transport	A2	8.67E+00	8.66E+00	4.86E-03	4.33E-03	1.91E-06	1.12E-01	4.78E-04
	Manufacturing	A3	3.85E+00	3.77E+01	-3.39E+01	5.25E-02	4.02E-06	1.29E-01	5.01E-03
	Total (Consumption grid)	A1-3	1.68E+02	2.00E+02	-3.23E+01	1.00E-01	2.53E-05	6.78E-01	3.03E-02
Construction process stage	Transport	A4	1.71E+01	1.71E+01	1.41E-02	6.87E-03	3.94E-06	8.28E-02	1.09E-03
	Construction	A5	7.18E+00	8.42E+00	-1.25E+00	4.46E-03	1.19E-06	3.03E-02	3.43E-03
90%- Recycling and 10% to landfill									
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	8.32E+00	8.31E+00	7.08E-03	3.26E-03	1.92E-06	3.37E-02	5.35E-04
	Waste processing	C3	3.62E+00	3.62E+00	1.28E-03	3.61E-04	7.73E-07	3.76E-02	1.12E-04
	Disposal	C4	5.28E-01	5.27E-01	5.22E-04	4.97E-04	2.13E-07	4.95E-03	4.82E-05
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	-7.58E+00	-7.47E+00	-9.67E-02	-1.05E-02	-6.02E-07	-4.81E-02	-4.07E-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)

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	9.55E-02	1.06E+00	3.06E-01	5.20E-04	1.29E+03	4.53E+01	2.81E-06
	Transport	A2	2.89E-02	3.20E-01	8.66E-02	2.52E-05	1.25E+02	4.90E-01	6.00E-07
	Manufacturing	A3	4.80E-02	4.92E-01	1.44E-01	1.56E-04	7.55E+02	9.07E+00	2.54E-06
	Total (Consumption grid)	A1-3	1.72E-01	1.87E+00	5.36E-01	7.01E-04	2.17E+03	5.49E+01	5.95E-06
Construction process stage	Transport	A4	2.41E-02	2.64E-01	7.88E-02	5.84E-05	2.57E+02	1.14E+00	1.45E-06
	Construction	A5	7.85E-03	8.52E-02	2.45E-02	2.99E-05	9.89E+01	1.31E+01	2.93E-07
90%- Recycling and 10% to landfill									
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	1.02E-02	1.11E-01	3.40E-02	2.89E-05	1.26E+02	5.65E-01	7.17E-07
	Waste processing	C3	1.66E-02	1.82E-01	5.01E-02	1.86E-06	4.96E+01	1.15E-01	7.70E-06
	Disposal	C4	1.72E-03	1.88E-02	5.48E-03	1.20E-06	1.47E+01	6.74E-01	9.97E-08
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	-1.11E-02	-1.33E-01	-3.44E-02	-7.06E-05	-1.10E+02	-1.44E+01	-6.07E-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)

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	8.29E+00	2.03E+03	7.41E-08	1.57E-06	2.61E+02
	Transport	A2	6.21E-01	9.18E+01	3.99E-09	8.80E-08	6.64E+01
	Manufacturing	A3	1.21E+01	5.05E+02	5.51E-08	3.30E-07	3.20E+03
	Total (Consumption grid)	A1-3	2.10E+01	2.63E+03	1.33E-07	1.99E-06	3.53E+03
Construction process stage	Transport	A4	1.32E+00	2.00E+02	6.63E-09	2.08E-07	1.73E+02
	Construction	A5	9.21E-01	2.24E+02	1.57E-08	4.33E-07	1.80E+02
90%- Recycling and 10% to landfill							
End of life	Deconstruction, demolition	C1	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Transport	C2	6.46E-01	9.81E+01	3.18E-09	1.03E-07	8.63E+01
	Waste processing	C3	2.24E-01	2.90E+01	1.12E-09	2.10E-08	6.32E+00
	Disposal	C4	6.53E-02	9.29E+00	2.36E-10	6.11E-09	3.09E+01
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	-1.70E+00	-1.27E+02	-7.39E-09	-1.34E-07	-1.01E+02

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)

Parameters describing resource use, primary energy								
			PERE	PERM	PERT	PENRE	PENRM	PENRT
			MJ	MJ	MJ	MJ	MJ	MJ
Product stage	Raw material supply	A1	9.73E+01	7.81E+00	1.05E+02	1.64E+03	1.97E+02	1.84E+03
	Transport	A2	1.52E+00	0.00E+00	1.52E+00	1.22E+02	0.00E+00	1.22E+02
	Manufacturing	A3	3.10E+02	3.40E+02	6.50E+02	8.39E+02	2.93E+01	8.68E+02
	Total (Consumption grid)	A1-3	4.09E+02	3.48E+02	7.57E+02	2.60E+03	2.27E+02	2.83E+03
Construction process stage	Transport	A4	3.58E+00	0.00E+00	3.58E+00	2.53E+02	0.00E+00	2.53E+02
	Construction	A5	1.63E+01	1.43E+01	3.06E+01	1.07E+02	9.07E+00	1.16E+02
90%- Recycling and 10% to landfill								
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	1.77E+00	0.00E+00	1.77E+00	1.23E+02	0.00E+00	1.23E+02
	Waste processing	C3	2.78E-01	0.00E+00	2.78E-01	4.87E+01	0.00E+00	4.87E+01
	Disposal	C4	1.25E-01	0.00E+00	1.25E-01	1.44E+01	0.00E+00	1.44E+01
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	-1.03E+01	0.00E+00	-1.03E+01	-1.10E+02	0.00E+00	-1.10E+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)

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	1.28E-02	0.00E+00	0.00E+00	1.08E+00
	Transport	A2	0.00E+00	0.00E+00	0.00E+00	1.21E-02
	Manufacturing	A3	1.31E+00	2.79E-04	0.00E+00	2.68E-01
	Total (Consumption grid)	A1-3	1.33E+00	2.79E-04	0.00E+00	1.36E+00
Construction process stage	Transport	A4	0.00E+00	0.00E+00	0.00E+00	2.84E-02
	Construction	A5	5.30E-02	1.12E-05	0.00E+00	3.08E-01
90%- Recycling and 10% to landfill						
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	1.40E-02
	Waste processing	C3	0.00E+00	0.00E+00	0.00E+00	2.83E-03
	Disposal	C4	0.00E+00	0.00E+00	0.00E+00	1.58E-02
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	0.00E+00	0.00E+00	0.00E+00	-3.39E-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)

Other environmental information describing waste categories					
			HWD	NHWD	RWD
			kg	kg	kg
Product stage	Raw material supply	A1	7.67E+00	1.17E+02	3.69E-03
	Transport	A2	1.47E-01	2.17E+00	6.66E+00
	Manufacturing	A3	1.38E+00	2.15E+01	4.29E-03
	Total (Consumption grid)	A1-3	9.20E+00	1.41E+02	6.67E+00
Construction process stage	Transport	A4	2.85E-01	4.99E+00	1.74E-03
	Construction	A5	3.88E-01	6.14E+00	2.67E-01
90%- Recycling and 10% to landfill					
End of life	Deconstruction, demolition	C1	0.00E+00	0.00E+00	0.00E+00
	Transport	C2	1.39E-01	2.46E+00	8.50E-04
	Waste processing	C3	6.51E-02	4.57E-01	3.43E-04
	Disposal	C4	1.53E-02	2.16E-01	9.64E-05
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	-6.33E-01	-1.93E+01	-5.62E-04

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

LCA Results (continued)

	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	1.22E-01	2.62E-06	2.35E-01	6.26E-02	-1.02E+01
	Total (Consumption grid)	A1-3	0.00E+00	1.22E-01	2.62E-06	2.35E-01	6.26E-02	-1.02E+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	5.83E-03	1.70E-04	9.39E-03	2.72E-03	-4.08E-01
90%- Recycling and 10% to landfill								
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	6.48E-05	1.04E-06	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

LCA Results - 1 tonne of Overcoating Silicone Dash Receiver

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	2.91E+02	2.90E+02	1.51E+00	1.43E-01	3.76E-05	1.28E+00	9.79E-02
	Transport	A2	2.28E+01	2.28E+01	1.65E-02	9.98E-03	5.17E-06	1.79E-01	1.38E-03
	Manufacturing	A3	3.84E+00	3.77E+01	-3.39E+01	5.25E-02	4.02E-06	1.29E-01	5.01E-03
	Total (Consumption grid)	A1-3	3.18E+02	3.50E+02	-3.24E+01	2.06E-01	4.68E-05	1.58E+00	1.04E-01
Construction process stage	Transport	A4	1.71E+01	1.71E+01	1.41E-02	6.87E-03	3.94E-06	8.28E-02	1.09E-03
	Construction	A5	1.32E+01	1.44E+01	-1.25E+00	8.68E-03	2.05E-06	6.66E-02	6.39E-03
90%- Recycling and 10% to landfill									
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	8.32E+00	8.31E+00	7.08E-03	3.26E-03	1.92E-06	3.37E-02	5.35E-04
	Waste processing	C3	3.62E+00	3.62E+00	1.28E-03	3.61E-04	7.73E-07	3.76E-02	1.12E-04
	Disposal	C4	5.28E-01	5.27E-01	5.22E-04	4.97E-04	2.13E-07	4.95E-03	4.82E-05
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	-7.58E+00	-7.47E+00	-9.67E-02	-1.05E-02	-6.02E-07	-4.81E-02	-4.07E-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)

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	2.60E-01	2.67E+00	7.87E-01	1.06E-03	3.30E+03	1.41E+02	1.36E-05
	Transport	A2	4.85E-02	5.34E-01	1.51E-01	7.36E-05	3.37E+02	1.44E+00	1.80E-06
	Manufacturing	A3	4.80E-02	4.91E-01	1.44E-01	1.56E-04	7.55E+02	9.06E+00	2.54E-06
	Total (Consumption grid)	A1-3	3.57E-01	3.69E+00	1.08E+00	1.29E-03	4.39E+03	1.51E+02	1.79E-05
Construction process stage	Transport	A4	2.41E-02	2.64E-01	7.88E-02	5.84E-05	2.57E+02	1.14E+00	1.45E-06
	Construction	A5	1.52E-02	1.58E-01	4.63E-02	5.35E-05	1.88E+02	1.69E+01	7.73E-07
90%- Recycling and 10% to landfill									
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	1.02E-02	1.11E-01	3.40E-02	2.89E-05	1.26E+02	5.65E-01	7.17E-07
	Waste processing	C3	1.66E-02	1.82E-01	5.01E-02	1.86E-06	4.96E+01	1.15E-01	7.70E-06
	Disposal	C4	1.72E-03	1.88E-02	5.48E-03	1.20E-06	1.47E+01	6.74E-01	9.97E-08
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	-1.11E-02	-1.33E-01	-3.44E-02	-7.06E-05	-1.10E+02	-1.44E+01	-6.07E-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)

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	2.00E+01	8.19E+03	7.73E-07	1.29E-05	7.29E+02
	Transport	A2	1.71E+00	2.57E+02	9.45E-09	2.60E-07	2.10E+02
	Manufacturing	A3	1.21E+01	5.05E+02	5.49E-08	3.30E-07	3.20E+03
	Total (Consumption grid)	A1-3	3.38E+01	8.95E+03	8.37E-07	1.35E-05	4.14E+03
Construction process stage	Transport	A4	1.32E+00	2.00E+02	6.63E-09	2.08E-07	1.73E+02
	Construction	A5	1.43E+00	4.76E+02	4.39E-08	8.95E-07	2.05E+02
90%- Recycling and 10% to landfill							
End of life	Deconstruction, demolition	C1	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Transport	C2	6.46E-01	9.81E+01	3.18E-09	1.03E-07	8.63E+01
	Waste processing	C3	2.24E-01	2.90E+01	1.12E-09	2.10E-08	6.32E+00
	Disposal	C4	6.53E-02	9.29E+00	2.36E-10	6.11E-09	3.09E+01
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	-1.70E+00	-1.27E+02	-7.39E-09	-1.34E-07	-1.01E+02

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)

Parameters describing resource use, primary energy								
			PERE	PERM	PERT	PENRE	PENRM	PENRT
			MJ	MJ	MJ	MJ	MJ	MJ
Product stage	Raw material supply	A1	2.65E+02	2.98E+01	2.95E+02	5.67E+03	3.58E+02	6.03E+03
	Transport	A2	4.48E+00	0.00E+00	4.48E+00	3.31E+02	0.00E+00	3.31E+02
	Manufacturing	A3	3.10E+02	3.40E+02	6.50E+02	8.39E+02	2.93E+01	8.68E+02
	Total (Consumption grid)	A1-3	5.80E+02	3.70E+02	9.50E+02	6.84E+03	3.87E+02	7.23E+03
Construction process stage	Transport	A4	3.58E+00	0.00E+00	3.58E+00	2.53E+02	0.00E+00	2.53E+02
	Construction	A5	2.31E+01	1.52E+01	3.83E+01	2.76E+02	1.55E+01	2.92E+02
90%- Recycling and 10% to landfill								
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	1.77E+00	0.00E+00	1.77E+00	1.23E+02	0.00E+00	1.23E+02
	Waste processing	C3	2.78E-01	0.00E+00	2.78E-01	4.87E+01	0.00E+00	4.87E+01
	Disposal	C4	1.25E-01	0.00E+00	1.25E-01	1.44E+01	0.00E+00	1.44E+01
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	-1.03E+01	0.00E+00	-1.03E+01	-1.10E+02	0.00E+00	-1.10E+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)

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	3.67E-02	0.00E+00	0.00E+00	3.34E+00
	Transport	A2	0.00E+00	0.00E+00	0.00E+00	3.56E-02
	Manufacturing	A3	1.31E+00	2.79E-04	0.00E+00	2.68E-01
	Total (Consumption grid)	A1-3	1.35E+00	2.79E-04	0.00E+00	3.65E+00
Construction process stage	Transport	A4	0.00E+00	0.00E+00	0.00E+00	2.84E-02
	Construction	A5	5.39E-02	1.12E-05	0.00E+00	3.99E-01
90%- Recycling and 10% to landfill						
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	1.40E-02
	Waste processing	C3	0.00E+00	0.00E+00	0.00E+00	2.83E-03
	Disposal	C4	0.00E+00	0.00E+00	0.00E+00	1.58E-02
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	0.00E+00	0.00E+00	0.00E+00	-3.39E-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)

Other environmental information describing waste categories					
			HWD	NHWD	RWD
			kg	kg	kg
Product stage	Raw material supply	A1	1.23E+02	5.14E+02	9.73E-03
	Transport	A2	3.82E-01	6.29E+00	6.59E+00
	Manufacturing	A3	1.37E+00	2.15E+01	4.29E-03
	Total (Consumption grid)	A1-3	1.25E+02	5.41E+02	6.60E+00
Construction process stage	Transport	A4	2.85E-01	4.99E+00	1.74E-03
	Construction	A5	5.02E+00	2.21E+01	2.64E-01
90%- Recycling and 10% to landfill					
End of life	Deconstruction, demolition	C1	0.00E+00	0.00E+00	0.00E+00
	Transport	C2	1.39E-01	2.46E+00	8.50E-04
	Waste processing	C3	6.51E-02	4.57E-01	3.43E-04
	Disposal	C4	1.53E-02	2.16E-01	9.64E-05
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	-6.33E-01	-1.93E+01	-5.62E-04

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

LCA Results (continued)

			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	1.22E-01	2.62E-06	2.35E-01	6.26E-02	-1.02E+01
	Total (Consumption grid)	A1-3	0.00E+00	1.22E-01	2.62E-06	2.35E-01	6.26E-02	-1.02E+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	5.83E-03	1.70E-04	9.39E-03	2.72E-03	-4.08E-01
90%- Recycling and 10% to landfill								
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	6.48E-05	1.04E-06	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

LCA Results - 1 tonne of Standard Dash Receiver

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	1.50E+02	1.49E+02	7.79E-01	4.13E-02	1.69E-05	4.17E-01	2.46E-02
	Transport	A2	7.04E+00	7.03E+00	4.34E-03	3.39E-03	1.57E-06	7.99E-02	4.02E-04
	Manufacturing	A3	3.84E+00	3.77E+01	-3.39E+01	5.25E-02	4.02E-06	1.29E-01	5.00E-03
	Total (Consumption grid)	A1-3	1.60E+02	1.93E+02	-3.32E+01	9.72E-02	2.25E-05	6.26E-01	3.00E-02
Construction process stage	Transport	A4	1.71E+01	1.71E+01	1.41E-02	6.87E-03	3.94E-06	8.28E-02	1.09E-03
	Construction	A5	6.89E+00	8.16E+00	-1.28E+00	4.33E-03	1.08E-06	2.82E-02	3.42E-03
90%- Recycling and 10% to landfill									
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	8.32E+00	8.31E+00	7.08E-03	3.26E-03	1.92E-06	3.37E-02	5.35E-04
	Waste processing	C3	3.62E+00	3.62E+00	1.28E-03	3.61E-04	7.73E-07	3.76E-02	1.12E-04
	Disposal	C4	5.28E-01	5.27E-01	5.22E-04	4.97E-04	2.13E-07	4.95E-03	4.82E-05
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	-7.58E+00	-7.47E+00	-9.67E-02	-1.05E-02	-6.02E-07	-4.81E-02	-4.07E-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)

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	9.09E-02	1.02E+00	2.79E-01	5.23E-04	9.36E+02	3.40E+01	2.40E-06
	Transport	A2	2.08E-02	2.30E-01	6.30E-02	2.15E-05	1.02E+02	4.13E-01	5.09E-07
	Manufacturing	A3	4.78E-02	4.91E-01	1.44E-01	1.56E-04	7.55E+02	9.43E+00	2.54E-06
	Total (Consumption grid)	A1-3	1.60E-01	1.74E+00	4.86E-01	7.00E-04	1.79E+03	4.38E+01	5.45E-06
Construction process stage	Transport	A4	2.41E-02	2.64E-01	7.88E-02	5.84E-05	2.57E+02	1.14E+00	1.45E-06
	Construction	A5	7.34E-03	8.01E-02	2.25E-02	2.99E-05	8.37E+01	1.26E+01	2.73E-07
90%- Recycling and 10% to landfill									
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	1.02E-02	1.11E-01	3.40E-02	2.89E-05	1.26E+02	5.65E-01	7.17E-07
	Waste processing	C3	1.66E-02	1.82E-01	5.01E-02	1.86E-06	4.96E+01	1.15E-01	7.70E-06
	Disposal	C4	1.72E-03	1.88E-02	5.48E-03	1.20E-06	1.47E+01	6.74E-01	9.97E-08
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	-1.11E-02	-1.33E-01	-3.44E-02	-7.06E-05	-1.10E+02	-1.44E+01	-6.07E-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)

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	7.96E+00	1.32E+03	6.03E-08	1.58E-06	3.18E+02
	Transport	A2	5.12E-01	7.61E+01	3.17E-09	7.43E-08	5.72E+01
	Manufacturing	A3	1.21E+01	5.02E+02	5.51E-08	3.29E-07	3.20E+03
	Total (Consumption grid)	A1-3	2.06E+01	1.90E+03	1.19E-07	1.98E-06	3.58E+03
Construction process stage	Transport	A4	1.32E+00	2.00E+02	6.63E-09	2.08E-07	1.73E+02
	Construction	A5	9.03E-01	1.94E+02	1.51E-08	4.33E-07	1.82E+02
90%- Recycling and 10% to landfill							
End of life	Deconstruction, demolition	C1	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Transport	C2	6.46E-01	9.81E+01	3.18E-09	1.03E-07	8.63E+01
	Waste processing	C3	2.24E-01	2.90E+01	1.12E-09	2.10E-08	6.32E+00
	Disposal	C4	6.53E-02	9.29E+00	2.36E-10	6.11E-09	3.09E+01
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	-1.70E+00	-1.27E+02	-7.39E-09	-1.34E-07	-1.01E+02

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)

Parameters describing resource use, primary energy								
			PERE	PERM	PERT	PENRE	PENRM	PENRT
			MJ	MJ	MJ	MJ	MJ	MJ
Product stage	Raw material supply	A1	9.38E+01	1.92E+01	1.13E+02	1.50E+03	4.93E+01	1.55E+03
	Transport	A2	1.28E+00	0.00E+00	1.28E+00	1.00E+02	0.00E+00	1.00E+02
	Manufacturing	A3	3.10E+02	3.40E+02	6.50E+02	8.39E+02	2.93E+01	8.68E+02
	Total (Consumption grid)	A1-3	4.05E+02	3.60E+02	7.65E+02	2.44E+03	7.86E+01	2.52E+03
Construction process stage	Transport	A4	3.58E+00	0.00E+00	3.58E+00	2.53E+02	0.00E+00	2.53E+02
	Construction	A5	1.61E+01	1.48E+01	3.09E+01	1.00E+02	3.15E+00	1.03E+02
90%- Recycling and 10% to landfill								
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	1.77E+00	0.00E+00	1.77E+00	1.23E+02	0.00E+00	1.23E+02
	Waste processing	C3	2.78E-01	0.00E+00	2.78E-01	4.87E+01	0.00E+00	4.87E+01
	Disposal	C4	1.25E-01	0.00E+00	1.25E-01	1.44E+01	0.00E+00	1.44E+01
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	-1.03E+01	0.00E+00	-1.03E+01	-1.10E+02	0.00E+00	-1.10E+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)

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	0.00E+00	0.00E+00	0.00E+00	8.16E-01
	Transport	A2	0.00E+00	0.00E+00	0.00E+00	1.02E-02
	Manufacturing	A3	1.31E+00	2.79E-04	0.00E+00	2.76E-01
	Total (Consumption grid)	A1-3	1.31E+00	2.79E-04	0.00E+00	1.10E+00
Construction process stage	Transport	A4	0.00E+00	0.00E+00	0.00E+00	2.84E-02
	Construction	A5	5.25E-02	1.12E-05	0.00E+00	2.98E-01
90%- Recycling and 10% to landfill						
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	1.40E-02
	Waste processing	C3	0.00E+00	0.00E+00	0.00E+00	2.83E-03
	Disposal	C4	0.00E+00	0.00E+00	0.00E+00	1.58E-02
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	0.00E+00	0.00E+00	0.00E+00	-3.39E-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)

Other environmental information describing waste categories					
			HWD	NHWD	RWD
			kg	kg	kg
Product stage	Raw material supply	A1	3.80E+00	1.20E+02	3.70E-03
	Transport	A2	1.19E-01	1.82E+00	6.66E+00
	Manufacturing	A3	1.38E+00	2.15E+01	4.29E-03
	Total (Consumption grid)	A1-3	5.30E+00	1.43E+02	6.67E+00
Construction process stage	Transport	A4	2.85E-01	4.99E+00	1.74E-03
	Construction	A5	2.32E-01	6.23E+00	2.67E-01
90%- Recycling and 10% to landfill					
End of life	Deconstruction, demolition	C1	0.00E+00	0.00E+00	0.00E+00
	Transport	C2	1.39E-01	2.46E+00	8.50E-04
	Waste processing	C3	6.51E-02	4.57E-01	3.43E-04
	Disposal	C4	1.53E-02	2.16E-01	9.64E-05
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	-6.33E-01	-1.93E+01	-5.62E-04

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

LCA Results (continued)

			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	1.22E-01	2.62E-06	2.35E-01	6.26E-02	-1.02E+01
	Total (Consumption grid)	A1-3	0.00E+00	1.22E-01	2.62E-06	2.35E-01	6.26E-02	-1.02E+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	5.83E-03	1.70E-04	9.39E-03	2.72E-03	-4.08E-01
90%- Recycling and 10% to landfill								
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	6.48E-05	1.04E-06	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

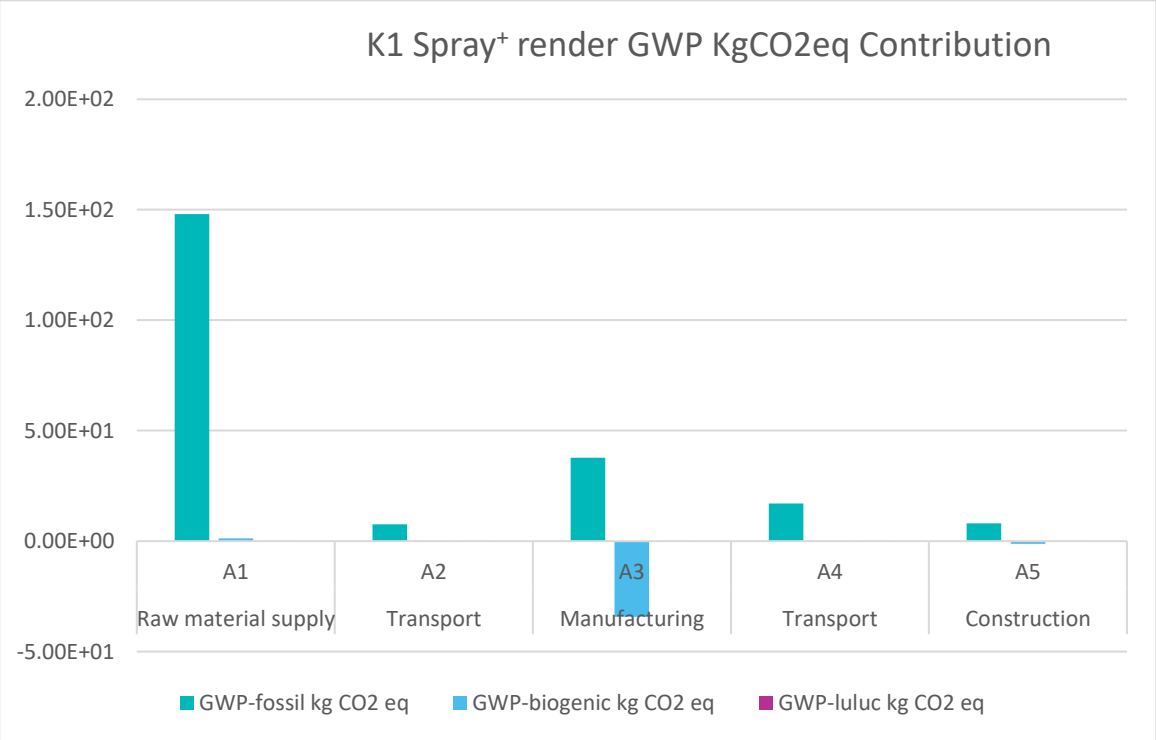
Scenarios and additional technical information			
Scenario	Parameter	Units	Results
A4 – Transport to the building site	Transportation of the product to the site has been modelled as an average scenario consisting of: 100 km by road (Lorry 16-32 tonne) 50 km by water (ship/barge) These distances represent the assumed average transport routes and are used to calculate the environmental impacts associated with the delivery of the product in Module A4. Capacity utilisation (incl. empty returns) - 26% Bulk density of transported products - 1000 (kg/m3)		
	Vehicle type	Lorry, 16-32 tonne	Diesel
	Distance:	km	100
	Water transport	Ship/barge	-
	Distance:	km	50
	Capacity utilisation (incl. empty returns)	%	26
	Bulk density of transported products	kg/m^3	1000
A5 – Installation in the building	Render is optimised for application through electric or diesel plastering machines. Guidance on optimal water flow settings and machine setup is available from Kilwaughter Minerals Ltd. For hand application, the product requires approximately 5.3 – 5.5 litres of clean water per 25 kg. Spray machines are different in that they measure water flow in terms of L/Hr. This varies depending on the rotor and stator used, the machine used and the speed setting on the machine. It should all average out to be similar to the 5.5 L/25 kg bag though as you are bringing it to a similar work ability. In this analysis, 5.5 L/25 kg has been used for the LCA analysis. The DU is 1 tonne, therefore the amount of water used for 1 tonne of render is 240 litres. Installation rate of 4% has been taken from BRE PCR EN15804 3.1		
	Installation wastage rate	%	4
	Water usage for mixing (worst case scenario)	litres	240
Packaging waste	Wood waste to recycling	kg	0.0266
	Plastic waste to incineration	kg	0.00011 - 0.0002
	Paper/cardboard waste to recycling	kg	0.00049

Scenarios and additional technical information			
Scenario	Parameter	Units	Results
C1 - Deconstruction	Polymer Modified Render is a versatile rendering mortar used as a multi-coat application for both internal and external surfaces. At the end of its life, the render will be manually removed using tools like hammers or chisels. The waste cement render can potentially be crushed and reused as aggregate in concrete or road base material. In some cases, polymer-modified cement render can also be fed into rotary kilns in cement production, where the high temperatures break down the polymers, converting waste into energy. For this analysis, a 100% recovery rate is assumed at the demolition site, with materials sent to a waste processing facility. In line with the BRE PCR EN 15804 3.1 end-of-life guidance, the end-of-life scenario for polymer-modified cement render has been used which has 90% of the waste render going to recycling, while the remaining 10% is sent to landfill Note: The end-of-life scenario used in the analysis is generic and applies to all products included in the study		
C2 – Transportation	50km by road has been modelled for module C2 as a typical distance from the demolition site to the disposal unit. However, end-users of the EPD can use this information to calculate the impacts of a bespoke transport distance for module C2 if required		
	Transportation of waste to the waste processing plant by Road	Lorry 16-32 tonne	Diesel
	Distance	km	50
C3 – Waste processing	At the waste processing facility, the collected polymer-modified render undergoes crushing to break it down into smaller particles. This process separates coarse aggregates and larger cement chunks from finer particles and polymers. Recycling polymer-modified cement render involves mechanical crushing, separation, and specialised processing to recover aggregates and fine materials. Although synthetic additives in polymer-modified cement render present challenges, the material can still be reused in non-structural applications such as road base, landscaping, and erosion control. The separation processes have not been included in Module C3 because they are assumed to be very small and effectively negligible. According to BRE PCR EN15804 3.1, the end-of-life scenario for polymer-modified cement render has been used which has 90% of the waste render is recycled, while the remaining 10% is sent to landfill.		
C3 – Waste processing	Concrete waste to recycling	kg	900
C4 – Disposal	10% is assumed as unrecoverable during the recycling process and it will end up in landfill.		
	Concrete waste to landfill	kg	100
Module D	Module D describes the net benefits related to exported energy and secondary materials, secondary fuels or secondary products resulting from reuse, recycling and energy recovery that take place beyond the system boundary for both products and buildings. Since the renders cannot be separated from the final construction waste therefore it will be treated as a concrete waste, at the waste processing facility the 90% of the concrete waste will be recycled therefore recycling the concrete will replace the virgin aggregates in the new system. It is assumed, 100% yield during the recycling process. Benefits of recycling concrete waste = 900 kg		

Interpretation of results

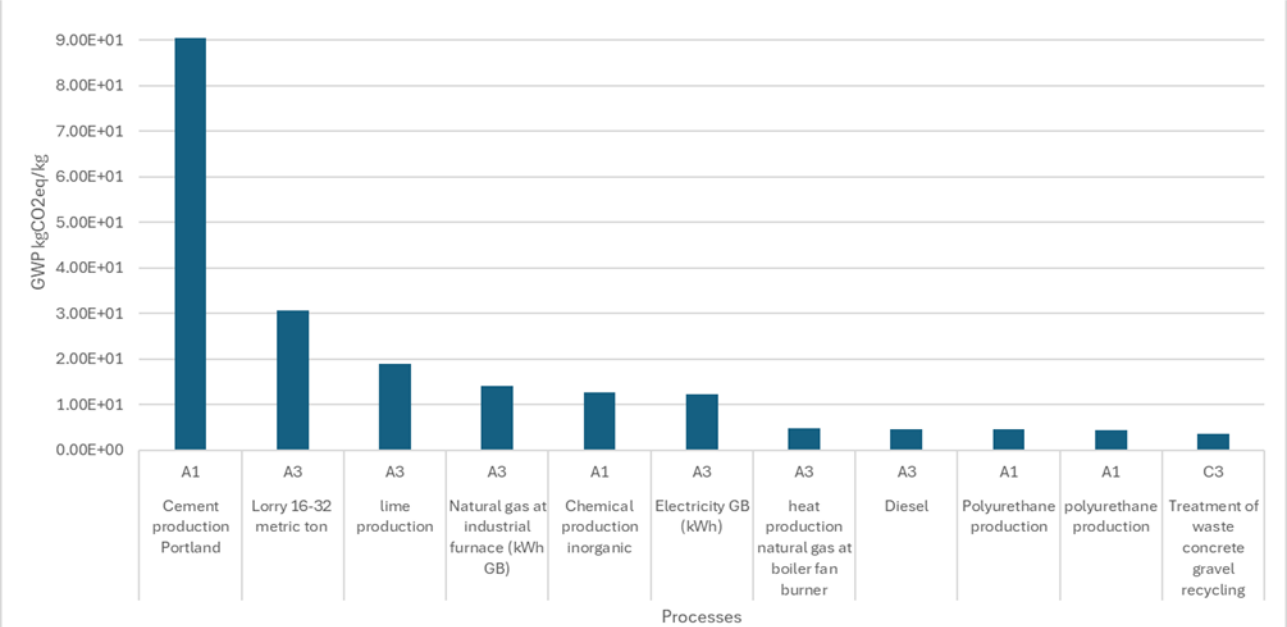
K1 spray⁺ render has been chosen randomly for the interpretation analysis shown below:

The bulk of the environmental impacts and primary energy demand are attributed to the upstream manufacturing process of the render products, covered by information modules A1-A3 of EN15804:2012+A2:2019. The figure below breaks down the GWP of K1 Spray⁺ render (taken as a representative product from the group) into clear categories to understand the modules which cause the largest environmental impact. It's clear that the majority of the environmental impact stems from the product modules (A1 – A3). Stage A1 (raw material) accounts for nearly all emissions, with a minor contribution from A2 (transportation). Stage A3 (manufacturing) shows a significant negative value, indicating a reduction in CO_2 equivalent emissions from biogenic sources due to the use of wooden pallets for packaging. The carbon stored in the pallets is expected to be released at installation (A5). In A4 transportation), there are some impacts during the transportation of the final product to the construction installation site



The chart shows the process contribution of K1 Spray⁺ render, where's the Portland cement usage as a A1 raw material is the largest contributor to global warming potential (GWP), emitting approximately 90 kg CO_2 equivalent per kg, significantly higher than all other processes. It is followed by lorry transport (16–32 metric tons) and lime production, which contribute around 30 kg and 18 kg CO_2e/kg, respectively. Mid-level contributors include natural gas usage in industrial furnaces, inorganic chemical production, and electricity generation in the UK, each ranging from about 11–13 kg CO_2e/kg. Lower contributors, including diesel use, polyurethane production, and concrete gravel recycling, contribute relatively minor amounts, all below 5 kg CO_2e/kg. This highlights that cement production is the most carbon-intensive process among those listed.

K1 Spray+ Process contribution



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EN 1015-10 Methods of test for mortar for masonry - Part 10: Determination of dry bulk density of hardened mortar

EN 1015-11 Methods of test for mortar for masonry - Part 11: Determination of flexural and compressive strength of hardened mortar

EN 1015-12 - Methods of test for mortar for masonry - Part 12: Determination of adhesive strength of hardened rendering and plastering mortars on substrates

EN 1015-21 Methods of test for mortar for masonry - Part 21: Determination of the compatibility of one-coat rendering mortars with substrates

EN 1015-18 Methods of test for mortar for masonry - Part 18: Determination of water absorption coefficient due to capillary action of hardened mortar

EN 1015-19 Methods of test for mortar for masonry - Part 19: Determination of water vapour permeability of hardened rendering and plastering mortars

EN 1745 Masonry and masonry products - Methods for determining thermal properties

BS EN 13501-1 Fire classification of construction products and building elements - Classification using data from reaction to fire tests

EN 1015-18 Methods of test for mortar for masonry - Part 18: Determination of water absorption coefficient due to capillary action of hardened mortar

EN 998-1 Specification for mortar for masonry - Part 1: Rendering and plastering mortar

EN 1015-21 Methods of test for mortar for masonry - Part 21: Determination of the compatibility of one-coat rendering mortars with substrates

BS-5262 - Code of practice for external renderings

BS EN ISO 9001:2015 – Quality management systems – Requirements (BSI registration number FM 85394)