Statement of Verification

BREG EN EPD No.: 000733 Issue 01

This is to verify that the

Environmental Product Declaration

provided by:

Specialist Door Solutions Ltd

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 unit of single Dfendoor door set including door and frame (926mm x 2105mm). The weight of the Declared Unit - door and frame is 109.43 kg including the glazed panel.

Company Address

Specialist Door Solutions Ltd,
Unit 1, Trading Estate
Borden
GU35 9HH

SDS | THE HEALTHCARE DOOR SPECIALIST

Signed for BRE Global Ltd	Hayley Thomson Operator	03 October 2025 Date of this Issue
03 October 2025 Date of First Issue		02 October 2030 Expiry Date

BRE Global Verified EPD

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ECO PLATFORM EPD VERIFIED

Environmental Product Declaration

EPD Number: **000733**

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**
Specialist Door Solutions Ltd, Unit 1, Trading Estate Borden GU35 9HH	Trident Utilities - Chris Wilson/ BRE LINA A2
Declared/Functional Unit	**Applicability/Coverage**
1 unit of single Dfendoor door set including door and frame (926mm x 2105mm). The weight of the Declared Unit - door and frame is 109.43 kg including the glazed panel.	Other (please specify). Product specific
EPD Type	**Background database**
Cradle to Gate with Module C and D with options	Ecoinvent 3.8

Demonstration of Verification
CEN standard EN 15804 serves as the core PCR [a]
Independent verification of the declaration and data according to EN ISO 14025:2010 ☐Internal ☒ External
(Where appropriate [b])Third party verifier: 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)

Specialist Door Solutions Ltd,
Unit 1, Trading Estate
Borden
GU35 9HH

Construction Product:

Product Description

Dfendoor is one of 4 doorsets within the SDS Doorset product range and is designed for use in A&E/ ED, ICU/ HDU within a hospital.

Dfendoor is delivered as a pre-hung option within a hardwood frame, it has a glazed vision panel and can be delivered with a wide range of architectural ironmongery.

Dfendoor is available to end users in four configurations: Double Door – Single Swing Systems, Double Door - Double Swing Systems, Single Door – Single Swing Systems and Single Door - Double Swing Systems. Each system offers a range of four products, each with different dimensions.

For the purposes of this LCA analysis, the Dfendoor Single Swing Door Set, which includes the door, glazing, and frame, with dimensions of 926mm x 2105mm. This is the most commonly delivered size and has been selected as the representative doorset to assess and demonstrate the product's environmental impact.

The LCA results presented apply specifically to doorsets of this size. The size modelled and door type i.e single swing door,is representative of the product studied and makes up 90% of the Dfendoor product range.

Technical Information

Standards
Dfendoor meets the requirements of the BM TRADA Q-Mark Timber Fire Door Manufacture scheme (certificate number 006/850)

Note: the technical information is from Specialist Door Solutions Limited BM Trada Q Mark Timber Fire Door Manufacture scheme certificate (certificate number 006/850). For more information: please contact Specialist Door Solutions Limited or visit https://specialistdoorsolutions.com/doorsets/sds-dfendoor/

Main Product Contents

Material/Chemical Input	%
Wood	65-70
PVC	20-25
Glass	5-10
Adhesive	<1
Others	<1

Manufacturing Process

Specialist Door Solutions manufacturing Process

1. Material Receipt & Inspection **-** Material is received and inspected. If material passes inspection it is placed in store ready for the manufacturing process. If material fails inspection, it rejected and returned to the supplier.

2. Raw Material - The door core blank is removed from stock

3. Beam Saw - The operative reads the schedule and inputs the dimension into the beam saw. The saw cuts the blank to the measurements as set out within the schedule

4. Drum Sander **-** The blank is placed within the machine and the edges sanded down and smoothed.

5. Adhesive Station:
   - An adhesive is sprayed onto the blank
   - An adhesive is sprayed onto the PVC plastic
   - The PVC plastic is placed onto the blank
   - The operative will use a roller to ensure that the PVC plastic adheres to the door blank

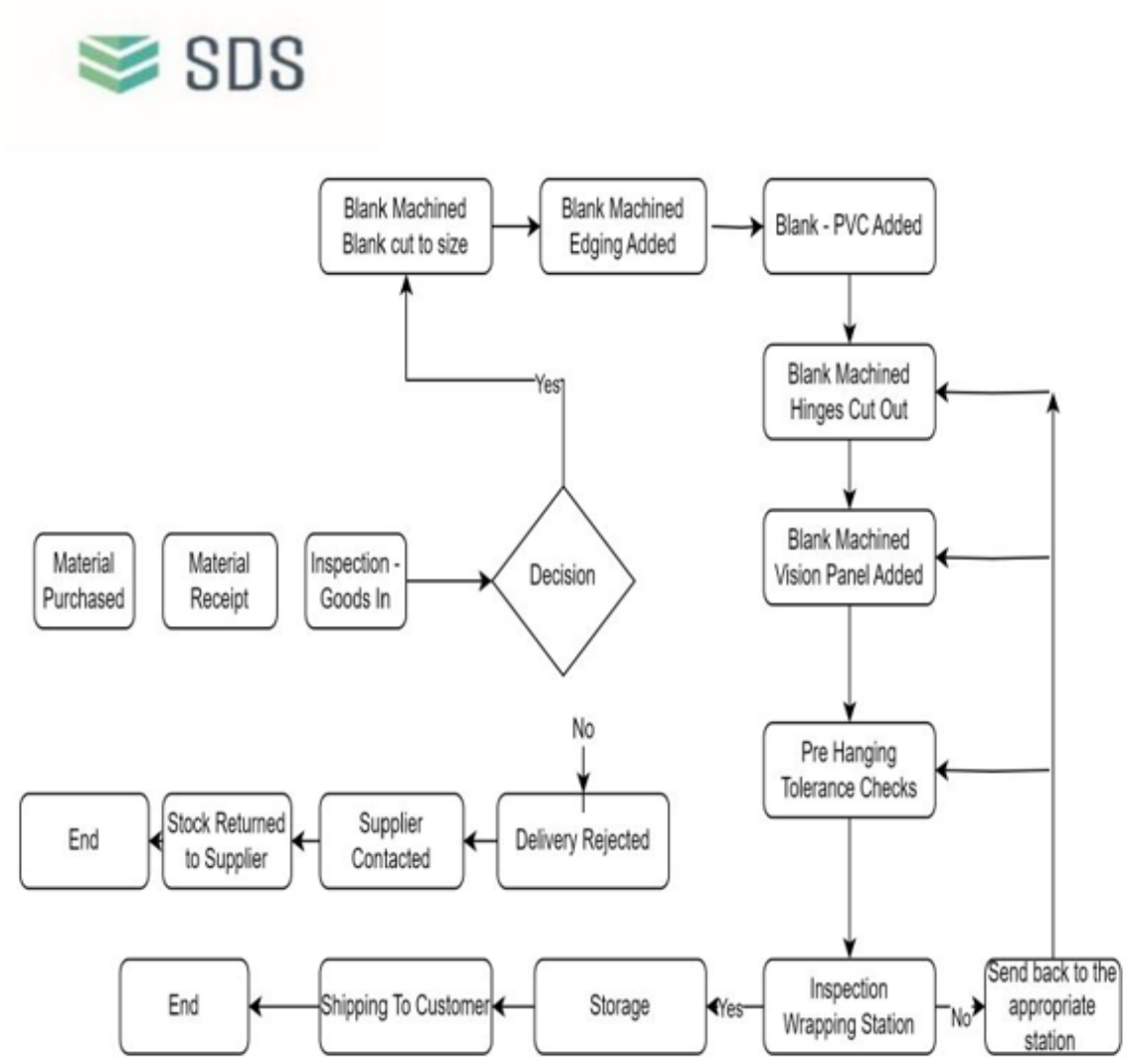
6. Thermoforming – Doors**:** The PVC plastic is placed in the machine. The rollers form the PVC plastic around the edges of the door blank

7. CNC **-** The blank is placed in the CNC where the hinges are cut out and if required a hole for a privacy screen. All this information is available on the schedule which is available at every station

8. Pre-Hanging **-**The ironmongery is added to the door by the operatives working at that station

9. Wrapping Station**:**
   - This is the last quality stop on the production line. The operative will be checking for any marks, scratches or bumps. Ensuring the sizing of the door is correct and the colour chosen by the client is correct.
   - If the door is rejected, then the PVC plastic will need to be removed and sent back to an allocated station
   - If the door is accepted, then it will go through the wrapping station, be loaded onto a pallet and ready for either storage on site or shipped out using a courier**.**
   - Any rejected door maybe skimmed, reused or scrapped**.**
   - Any scrapped door is recycled by our waste provider

Process flow diagram



Note: All the production wastages will be incinerated and recycled.

Construction Installation

The delivered doors and frames are assembled as a whole and fitted on site.
It is assumed therefore there is no wastage. Doors are supplied in a finished state ready for install.
Fitting instructions are supplied to installation contractors, this details the type of fixings required (frame fixing consisting of screws and plastic plugs) and the type of mastic to be applied between the door opening and the frame.
The frame fixings and mastic are not supplied, the installation contractors' source from local builders' merchants.
It has been assumed that local builders' merchants will be located on average 10km from the site of installation.
Installation energy usage based on standard electric hammer drill size (800W) and number of holes to be drilled into the opening (13 holes per door at 30 seconds per drilled hole).

Use Information

There are no specific in use and maintenance requirements for Dfendoor.

End of Life

The following disposal scenario has been assumed.
It is assumed that 100% of the product is recovered from the demolition site, and that the amount of energy required to install the door would be equivalent to the energy needed to remove it during demolition. The ancillary materials used for installing the door are considered waste at the demolition stage and are sent for recycling.

Life Cycle Assessment Calculation Rules

Declared / Functional unit description

1 unit of Single Dfendoor door set including door and frame (926mm x 2105mm). The weight of the Declared Unit - door and frame is 109.43 kg including the glazed panel.

System boundary

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

Data sources, quality and allocation

The datasets are derived from Ecoinvent v3.8, and the LCA tool used was BRE LINA A2. The LCA analysis is conducted for a Dfendoor door on a product specific basis with a weight of 109.43 kg, and it includes the total amount of MDF used to manufacture the Dfendoor doors over the period of one year (from 01/01/2023 to 31/12/2023). The results of this EPD refer to a Dfendoor door with a weight of 109.43 kg.

In addition to the Dfendoor product, other products are manufactured in the Specialist Door Solutions SDS manufacturing unit. Therefore, the allocation of electricity,, water consumption, and discharge are required. This allocation has been done according to the provisions of BRE PCR PN514 and EN 15804, using the mass production quantity. Data on waste generated per door, categorised by waste type, was multiplied by the production volume to calculate the total waste associated with the manufacturing of Dfendoor. Site wide values for energy, water and wastewater have been taken from bills. The manufacturer has confirmed that the manufacturing department is the main consumer of the company's electricity. The production of Dfendoor accounts for 67% of the year's operations. Figures for the raw materials, ancillary materials and packaging were from actual usages. During the production process, wood waste is sent for recycling & incineration. Plastic waste is sent to incineration in accordance with product Category Rules. Further, the mass balance with the range i.e., total raw material quantity is equal to the production output of the product.

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

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

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

Cut-off criteria

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

LCA Results

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

Parameters describing environmental impacts									
			GWP-total	GWP-fossil	GWP-biogenic	GWP-luluc	ODP	AP	EP-freshwater
			kg CO_2 eq	kg CO_2 eq	kg CO_2 eq	kg CO_2 eq	kg CFC11 eq	mol H^+ eq	kg $(PO_4)^{3-}$ eq
Product stage	Raw material supply	A1	-1.09E+02	1.11E+02	-2.21E+02	2.71E-01	4.21E-05	7.71E-01	3.37E-02
	Transport	A2	1.17E+01	1.17E+01	1.03E-02	5.44E-03	2.65E-06	1.10E-01	7.83E-04
	Manufacturing	A3	2.88E+01	1.80E+01	1.08E+01	1.55E-02	1.58E-06	4.43E-02	2.72E-03
	Total (Consumption grid)	A1-3	-6.82E+01	1.41E+02	-2.10E+02	2.92E-01	4.63E-05	9.26E-01	3.72E-02
Construction process stage	Transport	A4	3.69E+01	3.68E+01	8.49E-02	2.35E-02	7.72E-06	2.06E-01	5.53E-03
	Construction	A5	5.50E+00	3.09E+00	2.41E+00	1.11E-03	8.85E-08	7.44E-03	3.56E-04
End of life	Deconstruction, demolition	C1	1.65E+00	7.44E-01	9.02E-01	4.02E-05	7.84E-09	5.44E-04	4.95E-05
	Transport	C2	3.64E-01	3.64E-01	3.10E-04	1.43E-04	8.42E-08	1.48E-03	2.34E-05
	Waste processing	C3	1.71E+02	4.34E+01	1.28E+02	1.84E-03	2.32E-07	4.01E-02	1.04E-03
	Disposal	C4	4.25E-02	4.21E-02	3.76E-04	4.02E-05	1.37E-08	3.70E-04	6.43E-06
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	-5.64E+01	-5.57E+01	-5.88E-01	-8.31E-02	-3.70E-06	-3.51E-01	-2.81E-02

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

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

LCA Results (continued)

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

Parameters describing environmental impacts									
			EP-marine	EP-terrestrial	POCP	ADP-mineral &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	1.26E-01	1.36E+00	4.67E-01	1.31E-03	2.06E+03	8.29E+01	1.05E-05
	Transport	A2	2.94E-02	3.25E-01	9.23E-02	4.45E-05	1.74E+02	8.08E-01	1.09E-06
	Manufacturing	A3	1.38E-02	1.31E-01	3.89E-02	8.50E-05	3.94E+02	4.00E+00	3.69E-07
	Total (Consumption grid)	A1-3	1.69E-01	1.81E+00	5.98E-01	1.44E-03	2.63E+03	8.77E+01	1.20E-05
Construction process stage	Transport	A4	6.25E-02	6.86E-01	2.24E-01	5.63E-04	5.45E+02	4.05E+00	4.01E-06
	Construction	A5	1.42E-03	1.43E-02	5.25E-03	8.10E-06	1.84E+01	7.28E-01	6.65E-08
End of life	Deconstruction, demolition	C1	2.67E-04	2.43E-03	6.19E-04	2.36E-07	9.49E-01	6.65E-02	6.66E-09
	Transport	C2	4.45E-04	4.86E-03	1.49E-03	1.26E-06	5.50E+00	2.47E-02	3.14E-08
	Waste processing	C3	1.97E-02	2.00E-01	5.15E-02	1.29E-05	2.59E+01	4.78E+00	3.00E-07
	Disposal	C4	1.30E-04	1.41E-03	4.07E-04	1.36E-07	1.02E+00	4.70E-02	7.66E-09
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	-6.11E-02	-6.19E-01	-1.79E-01	-2.23E-04	-8.39E+02	-2.16E+01	-3.52E-06

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

LCA Results (continued)

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

Parameters describing environmental impacts							
			IRP	ETP-fw	HTP-c	HTP-nc	SQP
			kBq U^{235} eq	CTUe	CTUh	CTUh	dimensionless
Product stage	Raw material supply	A1	9.94E+00	2.29E+03	5.43E-07	1.82E-06	6.17E+03
	Transport	A2	8.94E-01	1.36E+02	6.27E-09	1.43E-07	1.39E+02
	Manufacturing	A3	9.57E+00	2.31E+02	1.02E-08	1.67E-07	2.90E+02
	Total (Consumption grid)	A1-3	2.04E+01	2.66E+03	5.59E-07	2.14E-06	6.60E+03
Construction process stage	Transport	A4	3.48E+00	5.53E+02	6.09E-08	7.13E-07	2.58E+02
	Construction	A5	9.17E-02	2.61E+01	3.59E-09	2.28E-08	5.40E+00
End of life	Deconstruction, demolition	C1	1.57E-02	3.76E+00	1.99E-10	7.03E-09	4.47E-01
	Transport	C2	2.83E-02	4.29E+00	1.39E-10	4.50E-09	3.78E+00
	Waste processing	C3	2.71E-01	1.15E+02	3.01E-08	2.27E-07	8.14E+00
	Disposal	C4	4.54E-03	1.62E+01	3.07E-11	4.44E-10	2.55E+00
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	-1.25E+01	-9.29E+02	-3.90E-08	-1.26E-06	-1.73E+03

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

LCA Results (continued)

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

Parameters describing resource use, primary energy								
			PERE	PERM	PERT	PENRE	PENRM	PENRT
			MJ	MJ	MJ	MJ	MJ	MJ
Product stage	Raw material supply	A1	3.13E+03	1.08E+03	4.22E+03	1.56E+03	5.26E+02	2.09E+03
	Transport	A2	2.38E+00	0.00E+00	2.38E+00	1.70E+02	0.00E+00	1.70E+02
	Manufacturing	A3	-3.12E+01	1.33E+02	1.02E+02	3.77E+02	1.03E+02	4.79E+02
	Total (Consumption grid)	A1-3	3.11E+03	1.21E+03	4.32E+03	2.11E+03	6.28E+02	2.74E+03
Construction process stage	Transport	A4	1.51E+01	0.00E+00	1.51E+01	5.37E+02	0.00E+00	5.37E+02
	Construction	A5	-2.05E+01	2.10E+01	5.18E-01	4.60E+00	7.82E+00	1.24E+01
End of life	Deconstruction, demolition	C1	-8.40E+00	8.51E+00	1.14E-01	-5.70E+00	6.78E+00	1.08E+00
	Transport	C2	7.75E-02	0.00E+00	7.75E-02	5.40E+00	0.00E+00	5.40E+00
	Waste processing	C3	-1.11E+03	1.11E+03	7.06E-01	-5.23E+02	5.44E+02	2.05E+01
	Disposal	C4	1.39E-02	0.00E+00	1.39E-02	1.00E+00	0.00E+00	1.00E+00
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	4.18E+01	-4.38E+02	-3.96E+02	-8.42E+02	0.00E+00	-8.42E+02

PERE = Use of renewable primary energy excluding renewable primary energy used as raw materials;
PERM = Use of renewable primary energy resources used as raw materials;
PERT = Total use of renewable primary energy resources;
PENRE = Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials;
PENRM = Use of non-renewable primary energy resources used as raw materials;
PENRT = Total use of non-renewable primary energy resource

LCA Results (continued)

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

Parameters describing resource use, secondary materials and fuels, use of water						
			SM	RSF	NRSF	FW
			kg	MJ net calorific value	MJ net calorific value	m^3
Product stage	Raw material supply	A1	7.49E-01	0.00E+00	0.00E+00	1.98E+00
	Transport	A2	0.00E+00	0.00E+00	0.00E+00	2.00E-02
	Manufacturing	A3	1.20E-01	2.39E-04	0.00E+00	1.40E-01
	Total (Consumption grid)	A1-3	8.70E-01	2.39E-04	0.00E+00	2.14E+00
Construction process stage	Transport	A4	0.00E+00	0.00E+00	0.00E+00	1.01E-01
	Construction	A5	4.73E-02	3.64E-07	0.00E+00	1.73E-02
End of life	Deconstruction, demolition	C1	4.70E-05	3.64E-07	0.00E+00	1.63E-03
	Transport	C2	0.00E+00	0.00E+00	0.00E+00	6.13E-04
	Waste processing	C3	0.00E+00	0.00E+00	0.00E+00	1.12E-01
	Disposal	C4	0.00E+00	0.00E+00	0.00E+00	1.10E-03
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	0.00E+00	0.00E+00	0.00E+00	-5.41E-01

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

LCA Results (continued)

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

Other environmental information describing waste categories					
			HWD	NHWD	RWD
			kg	kg	kg
Product stage	Raw material supply	A1	9.91E+02	2.25E+04	8.80E-01
	Transport	A2	2.12E-01	3.50E+00	6.82E+02
	Manufacturing	A3	8.97E-01	2.42E+01	2.71E-03
	Total (Consumption grid)	A1-3	9.92E+02	2.25E+04	6.83E+02
Construction process stage	Transport	A4	1.16E+00	2.39E+01	3.60E+03
	Construction	A5	1.05E-01	2.97E+00	2.60E+00
End of life	Deconstruction, demolition	C1	5.88E-02	1.54E+00	5.77E-06
	Transport	C2	6.06E-03	1.08E-01	3.72E-05
	Waste processing	C3	1.12E+00	1.00E+02	4.94E-05
	Disposal	C4	2.07E-03	1.04E+00	6.24E-06
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	-4.77E+00	-1.54E+02	-3.20E-03

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

LCA Results (continued)

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

Other environmental information describing output flows – at end of life								
			CRU	MFR	MER	EE	Biogenic carbon (product)	Biogenic carbon (packagin
			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	-1.13E+01	0.00E+00
	Transport	A2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Manufacturing	A3	0.00E+00	4.15E-03	1.92E-06	1.91E-01	4.08E+00	-5.88E-01
	Total (Consumption grid)	A1 -3	0.00E+00	4.15E-03	1.92E-06	1.91E-01	-7.27E+00	-5.88E-01
Construction process stage	Transport	A4	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Construction	A5	0.00E+00	3.05E-05	1.50E-01	2.90E-04	0.00E+00	0.00E+00
End of life	Deconstruction, demolition	C1	0.00E+00	6.31E-06	3.90E-02	2.90E-04	3.14E-01	0.00E+00
	Transport	C2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Waste processing	C3	0.00E+00	0.00E+00	1.77E+01	0.00E+00	1.74E+01	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	-8.81E-04	-5.36E-06	-8.92E-01	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

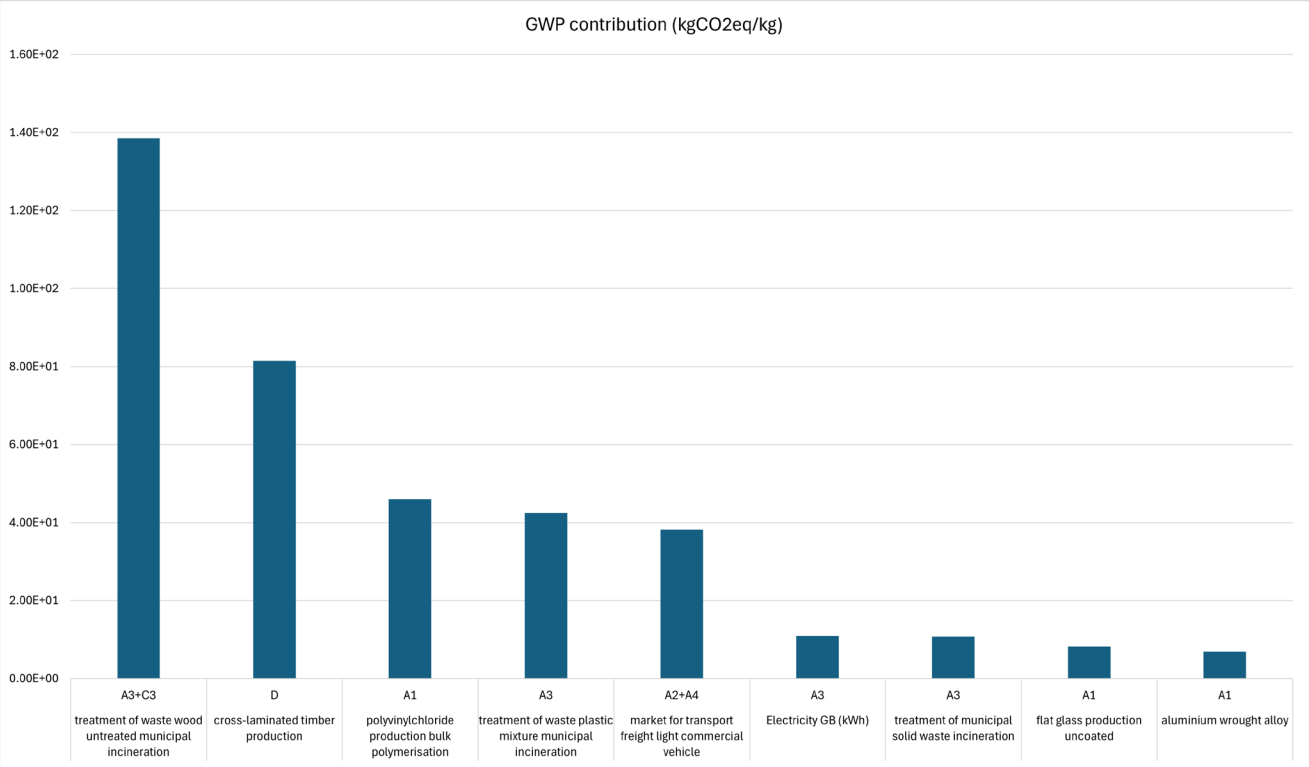
Scenarios and additional technical information			
Scenario	Parameter	Units	Results
A4 – Transport to the building site	This is the average distance the stated production output (4612 doors) travels to site. 112 miles (180.2 km) average delivery distance. The analysis undertaken is based on the number of deliveries in the period and destination of deliveries. There were 141 deliveries undertaken and mileage of each recorded.		
	Transport by Road to ports (km)	Van	180.2
	Capacity utilisation (incl. empty returns)	%	40
	Bulk density of transported products	kg/m^3	303.42
A5 – Installation in the building	The delivered doors and frames are assembled as a whole and fitted on site. It is assumed therefore there is no wastage. Doors are supplied in a finished state ready for install. Fitting instructions are supplied to installation contractors, this details the type of fixings required (frame fixing consisting of screws and plastic plugs) and the type of mastic to be applied between the door opening and the frame. The frame fixings and mastic are not supplied, the installation contractors' source from local builders' merchants. It has been assumed that local builders' merchants will be located on average 10km from the site of installation. Installation energy usage based on standard electric hammer drill size (800W) and number of holes to be drilled into the opening (13 holes per door at 30 seconds per drilled hole).		
Ancillary required for installation	Frame fixings Screw	kg	0.182
Ancillary required for installation	Plastic Plugs	kg	0.039
Energy required	Electricity	kWh	0.029
Packaging waste	Plastic mixed waste to incineration	kg	0.01
	Plastic waste to incineration	kg	0.01
	Plastic mixed waste to incineration	kg	0.75
	Wood waste to recycling	kg	1.5
C1 - Deconstruction	Door reaches a state of non-compliance or is no longer required on site: Erection of temporary dust barriers. Shut off any electrical connections (for automatic doors or signage). Remove hinges from door and remove door from the structural opening. Remove frame fixings using electric driver. The following disposal scenario has been assumed. It is assumed that 100% of the product is recovered from the demolition site, and that the amount of energy required to install the door would be equivalent to the energy needed to remove it during demolition. The ancillary materials used for installing the door are considered waste at the demolition stage and are sent for recycling.		
	Electricity	kWh	0.067
	Frame fixing steel waste during the deconstruction process to recycling	kg	0.182
	Frame fixing plastic waste during the deconstruction process to incineration	kg	0.039
	General waste during the deconstruction process	kg	1.2

Scenarios and additional technical information			
Scenario	Parameter	Units	Results
C2 – Transportation	Transportation to waste processing - 100% returned from hospital location to waste disposal site. Assumed all hospitals will be located in cities and towns and will be a maximum distance of 20km from waste disposal facility.		
	Transport to local waste processing facility using Lorry, 16-32 metric ton using the roadways	km	20
C3 – Preprocessing	Upon receipt of door at waste processing the following will be undertaken: • All door furniture manually removed • Glazing removed • Plastic components removed • Mineral & chemical components removed. Materials sorted into different waste streams. Industrial default end-of life scenarios have been modelled in accordance with BRE Global Product Category Rules (PCR) PN 514 Rev 3.1.		
	55% of the wood waste to recycling	kg	43.813
	45% of the wood waste to incineration	kg	35.847
	95% of the steel waste to recycling	kg	0.8075
	61% of the glass waste to recycling	kg	5.1545
	100% of the plastic waste to incineration	kg	17.66
	100% of the inert waste to incineration	kg	1.36
	95% of the aluminium waste to recycling	kg	0.475
C4 – Disposal	Unrecovered waste steel, glass, aluminium, and adhesive waste is sent to landfill.		
	39% of the glass waste to landfill	kg	3.2955
	5% of the steel waste to landfill	kg	0.0425
	100% of the adhesive waste to landfill	kg	0.95
	5% of the aluminium waste to landfill	kg	0.025

Scenarios and additional technical information			
Scenario	Parameter	Units	Results
Module D	“Benefits and loads beyond the system boundary” (module D) accounts for the environmental benefits and loads resulting from waste Steel, plastic, glass wood which is collected for recycling and incineration at end of life. For benefits and loads of recycling steel are calculated by excluding the pre-existing recycled Steel that is used in the primary process. The secondary content of stainless steel is 57.3%, the primary content to calculate the benefits are 0.8075*(1-57.3%)= 0.3448 kg. For benefits and loads of recycling aluminium are calculated by excluding the pre-existing recycled aluminium that is used in the primary process. The secondary content of Extruded Aluminium profiles is 7.4%, the primary content to calculate the benefits are 0.475*(1-7.4%)= 0.43985 kg. Benefits due to incineration of wood = 35.847 kg Benefits due to recycling of wood = 43.813 kg Benefits due to incineration of PVC = 17.66 kg Benefits due to recycling of glass (pre-existing recycled content<1%, so can be ignored) = 5.1545 kg Benefits due to incineration of mineral= 1.36 kg For benefits due to incineration of PVC and wood waste, the EU electricity (Electricity, high voltage (RER) market for electricity, high voltage) with an emission factor of 0.396kgCO2eq/kWh, EU heat (Heat, district or industrial, natural gas (RER) market for heat, district or industrial, natural gas) with an emission factor of 0.187kgCO2eq/kWh, and EU heat (Heat, district or industrial, other than natural gas (RER) market for heat, district or industrial, other than natural gas) with an emission factor of 0.244kgCO2eq/kWh have been used as the background data for the energy recovered.		

Interpretation

The top three contributors across the whole life cycles covered by information modules A1-D of EN15804:2012+A2:2019 — treatment of untreated wood waste via municipal incineration, cross-laminated timber production, and polyvinylchloride (PVC) production — with a CO_2-equivalent around 50–140 $kgCO_2eq/kg$. These are followed by plastic waste incineration and transport by light commercial vehicles. The lowest contributors are electricity use (GB, 2022), treatment of municipal solid waste incineration, flat glass production and aluminium wrought alloy production, all around or below 10 $kgCO_2eq/kg$. This suggests a re-prioritization in emission sources, where certain waste treatments and material productions remain key hotspots for carbon impact.



Note: In this LCA, a background dataset wood chips from cross-laminated timber has been used for benefits and loads of wood waste to recycling in Module D. The GWP impact of benefits and loads due to recycling of wood waste is a positive figure (environmental burden) and this is because the sequestered carbon is being released from the wood at the end of life of this product.

End-user table

The LCA results in the EPD are for 1 unit of Single Dfendoor door set including door and frame (926mm x 2105mm). The weight of the Declared Unit - door and frame is 109.43 kg including the glazed panel. However, a change will be implemented to the product design in the recent future. The change is to the thickness of the PVC covering from 2mm to 1.5mm, which means a 25% reduction of PVC weight. Therefore, an LCA has been made based on this change to estimate the environmental impacts of the new design.

The current weight of PVC of this product is 17.66 kg/unit, when the thickness is reduced from 2mm to 1.5 mm, the new weight of PVC will be 13.245 kg/unit. The new declared unit will therefore be reduced to around 105.02kg/unit (the worst-case scenario has been used, assuming other composition remains the same). The LCA results (A1-A3) based on the change has been attached below as a reference for the EPD users. Specialist Door Solutions Ltd will inform Trident Utilities and BRE to update the LCA and the EPD once the new data is ready.

Product	PVC covering thickness (mm)	PVC weight (kg)	Declared Unit (kg/unit)	GWP-total A1-A3 (kgCO2eq/unit)
Current design	2	17.66	109.43	-6.82E+01
25% PVC reduced design	1.5	13.245	105.02	-8.13E+1

References

BSI. Sustainability of construction works – Environmental product declarations – Core rules for the product category of construction products. BS EN 15804:2012+A2:2019. London, BSI, 2019.

BSI. Environmental labels and declarations – Type III Environmental declarations – Principles and procedures. BS EN ISO 14025:2010 (exactly identical to ISO 14025:2006). London, BSI, 2010.

BSI. Environmental management – Life cycle assessment – Principles and framework.
BS EN ISO 14040:2006. London, BSI, 2006.

BSI. Environmental management – Life cycle assessment – requirements and guidelines.
BS EN ISO 14044:2006. London, BSI, 2006.

BM TRADA Q-Mark Timber Fire Door Manufacture, certificate number 006/850.