Statement of Verification

BREG EN EPD No.: 000715 Issue 01

This is to verify that the

Environmental Product Declaration

provided by:

Doby Cleats Ltd TA Doby Verrolec

is in accordance with the requirements of:

EN 15804:2012+A2:2019

and

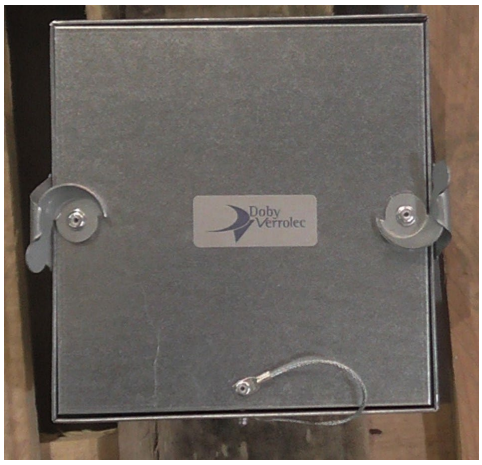
BRE Global Scheme Document SD207

This declaration is for:

1 unit of Tabbed Duct Access Door (Square) with a weighted average mass of 1.59 kg

Company Address

Doby Cleats Ltd TA Doby Verrolec
Harelaw Industrial Estate
Annfield Plain
DH9 8UJ
United Kingdom



Signed for BRE Global Ltd	Hayley Thomson Operator	22 July 2025 Date of this Issue
22 July 2025 Date of First Issue		21 July 2030 Expiry Date

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Environmental Product Declaration

EPD Number: **000715**

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**
Doby Cleats Ltd TA Doby Verrolec	Anthony Harrison/BRE LINA A2
Declared/Functional Unit	**Applicability/Coverage**
1 unit of Tabbed Duct Access Door (Square) with a weighted average mass of 1.59 kg	Product Average.
EPD Type	**Background database**
Cradle to Gate with options	Ecoinvent v3.8 (2021)

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: Bala Subramanian
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)

Doby Cleats Ltd TA Doby Verrolec
Harelaw Industrial Est, Annfield Plain
DH9 8UJ

Construction Product:

Product Description

Doby Cleats Ltd TA Doby Verrolec - Tabbed Duct Access Doors are designed to provide trouble-free access to fire and volume control dampers along with associated ventilation & air conditioning equipment.

All Tabbed Duct Access Doors will have a retaining wire, a foam gasket surrounding all sides, cam locks (which vary as we go up size from the standard 4 to 6 for the bigger access doors), and brackets (likewise the number depends on amount of cam locks).

A Tabbed Duct Access Door is a removable panel designed to provide convenient access to the interior of ductwork for inspection, cleaning, maintenance, or repair. It features pre-formed metal tabs or flanges around the perimeter that allow it to be easily secured to the duct without the need for external fasteners or welding. These tabs are bent over the duct wall from the inside, creating a tight and stable fit.

Each door comes in an array of square sizes, and weights do vary due to sizing. The product contains a polystyrene EPS 100 insulation along with additional features such as safety retaining wire as standard.

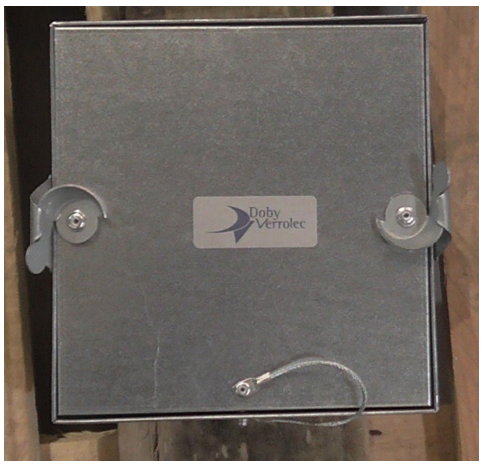
Tabbed Duct Access Doors come with a fully Z275G galvanised steel coating as standard, or in stainless steel on request, including the locking cams and keeps which are made in house. Rounded tabs are supplied for safety on the Tabbed Duct Access Doors, and they also come complete with a door retaining wire as standard. The wire is not designed to be used as the doors' only point of support.

Tabbed Duct Access Doors fully conform to BESA DW144 regulations and BS EN15727:2010. Both applications require no further sealant or extra fixings to produce an airtight seal. Cam locks hold the lid and body together along with adhesive foam gasket which creates a vacuum type seal.

Technical Information

Property	Value, Unit
Dimensions	Varies in a range of sizes
BESA DW144 requirements	Conforms
BS EN15727:2010 requirements	Conforms
BSRIA independent pressure test	Pass
Galvanised steel coating	Z275G
DW144/143 air leakage requirements	Conforms
BS EN 10142:2000 requirements	Conforms
BS EN 10346:2015 requirements	Conforms
Gasket compression level for effective seal	30%
Gasket service temperature range	-30 to 70 degrees Celsius
Gasket life expectancy	>20 years
Gasket replaces Chloroprene foam seals	n/a
Gasket has good resistance to dilute acids and alkalis	n/a
Gasket dimensions	14.95 mm x 4.5 – 4.58 mm

*All technical properties above are the same for all square products within the Tabbed Duct Access Door Range.
**The data above has been sourced from Doby Cleats Ltd TA Doby Verrolec's brochure for their Tabbed Duct Access Doors (1st October 2024), Doby Green Gasket Factsheet and Gasket technical datasheet. Please contact Doby Cleats Ltd TA Doby Verrolec for more information.



Main Product Contents

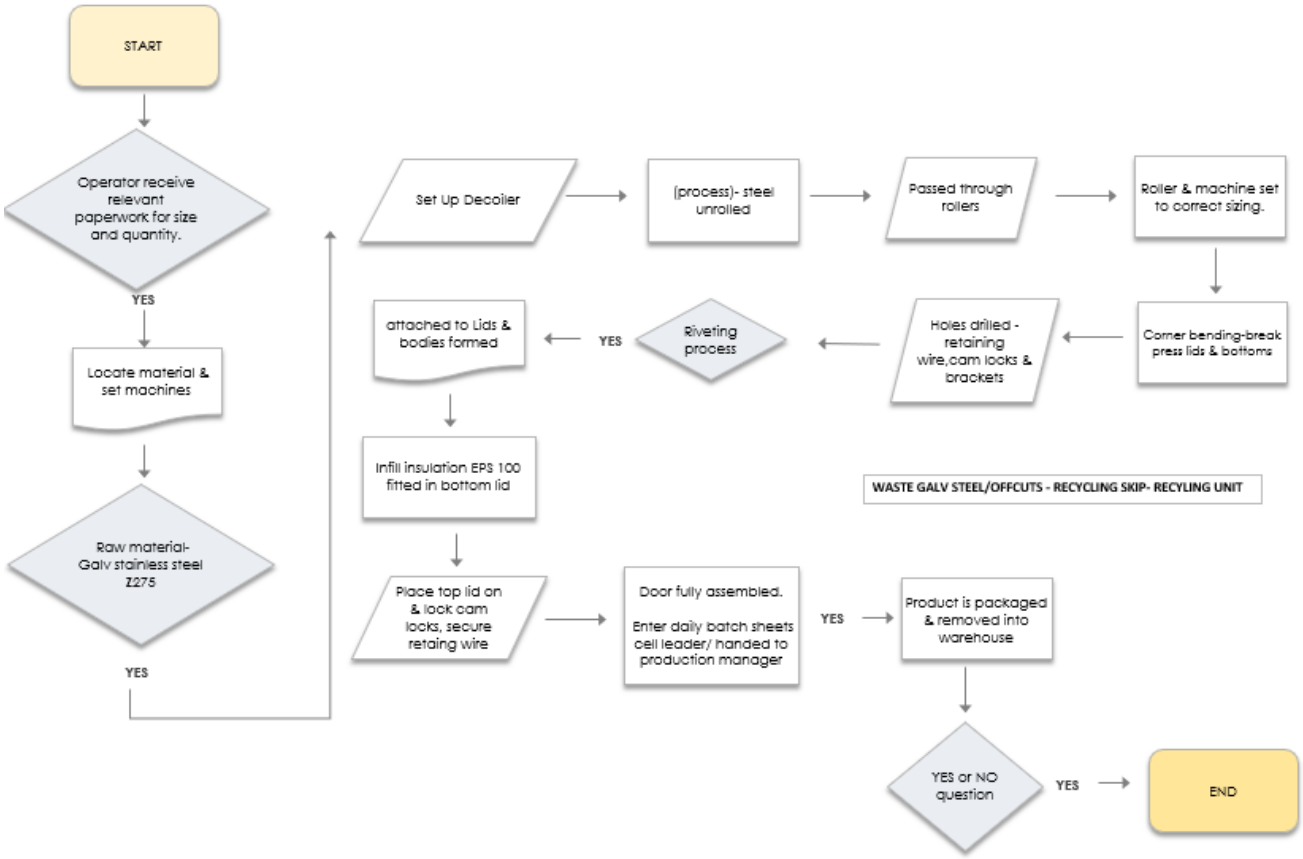
Material/Chemical Input	%
Galvanised/stainless steel	98.2
Expanded polystyrene	1.5
PVC foam tape (gasket)	0.3

*Please note that the composition above is a weighted-average composition of all square products within the Tabbed Access Door Range, based on 2023 production output relative to sales.

Manufacturing Process

Rolls of Galvanized stainless steel coated to Z275 are set up on a decoiler in which the steel is unrolled and passed through the door line rollers to size that machine is set up at, break press machine bends door corners for lids & bottoms, next phase is to drill holes for parts such as retaining wire, cam locks/brackets where they will be riveted to the lids and bottoms, now place infill insulation EPS 100 within bottom lid, shape stainless steel, place lid on top lock cam locks to brackets fastening the door together & retaining wire on. Once the Tabbed Duct Access Door is deemed finished it is stacked on pallets and wrapped, stored ready for delivery.

Process flow diagram



Construction Installation

Once the product has been built at the factory for a customer at a specific size to suit, installation of the product is quite simple since it is built to fit into position of the HVAC units with the customer's facilities. The required aperture for the access door to fit into should be between 30-32mm smaller than the door size being used. The wire retained door is carefully swung away to the bottom prior to fitting. All doors are connected to the door frame with a retaining wire. When the Tabbed Duct Access Door is removed for fitting and later, inspection, care must be taken. The standard retaining wire is not designed to be used as the door's only point of support. The Tabbed Duct Access Doors can also be supplied without retaining wire upon request.

The location is marked on the duct surface at the correct dimensions required for the hole size, and an aperture cut using Doby Cleats Ltd TA Doby Verrolec Turbo Shears or similar equipment. The access door subframe is secured into the aperture by pressing down two tabs from diagonally opposed corners. Using a support to hammer against, the remaining metal tabs on the fitted subframe are tapped down to ensure that all tabs are knocked over and the sealing gasket is under compression on all faces, including the corners. The fit is

completed by mounting the remaining door into the frame and the camlocks are tightened to the degree of tightness required. Care must be taken not to over-tighten and to ensure that the retaining wire is not snagged between the door and frame.

Tabbed Duct Access Doors are ordered by customers to one of many specific sizes, which are built at Doby Cleats Ltd TA Doby Verrolec and sent out. There is zero wastage in the installation process as the product comes pre-built, and there are zero emissions during the installation process. In terms of packaging waste, all pallets are sent back to Doby Cleats Ltd TA Doby Verrolec where it will be determined if they can be reused for future deliveries. If any have reached the end of their life and are unusable, they will be sent to recycling and replaced with new stock. It is assumed that all plastic wrap is 100% landfilled as a worst-case scenario.

Use Information

Maintenance of the product, which is advised by Doby Cleats Ltd TA Doby Verrolec, is a simple visual check 1-2 times a year unless there are reports of a problem i.e. damage. The consumer should check that the clips and retaining wire and in good condition, take the lid off and visually check the infill and foam gasket. This specific product should not require any major changes, if anything. Possibly over the years the foam gasket may require replacement if it loses its stick or there are reports of leaks.

End of Life

Deconstruction of the product will consist of simple removal from HVAC duct system using a claw hammer or screwdriver, and removal/stripping of the foam gasket and EPS insulation is by hand. The product components will then be sent to a recycling unit, incineration with energy recovery or landfill as per the end-of-life scenarios for steel and insulation (rigid sheet) EPS stated in Appendix D of the BRE PCR document.

As stated in the data collection form, there will be no use of energy and water, and no emissions during the dismantlement of the product. It will simply be removed from HVAC unit that it has lived in and then dismantled with components being sent to the appropriate waste destination.

Life Cycle Assessment Calculation Rules

Declared / Functional unit description

1 unit of Tabbed Duct Access Door (Square) with an average mass of 1.59 kg

System boundary

In accordance with the modular approach as defined in EN15804:2012+A2:2019 and the BRE 2023 Product Category Rules (PN 524 Rev 3.1), this cradle-to-gate with options & modules C and D EPD includes the processes covered during the raw material extraction and manufacturing phase in modules A1 to A3. It also includes transport of the finished product to site in module A4, installation within the building in module A5, and the end-of-life scenario in modules C1, C2, C3, C4 and module D.

Data sources, quality and allocation

Specific primary data derived from Doby Cleats Ltd TA Doby Verrolec have been modelled using LINA A2 software for the period 1st January 2023 to 31st December 2023. In accordance with the requirements of EN15804, the most current available data have been used. Secondary data have been obtained for all remaining upstream and downstream processes that are beyond the control of the manufacturer 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 EN15804+A2:2019. The square Tabbed Duct Access Doors are not the only products manufactured at the Do Doby Cleats Ltd TA Doby Verrolec by Verrolec factory. An allocation by mass of the site process data has therefore been carried out to determine the correct quantities of energy, water and waste attributable to the square Tabbed Duct Access Doors production.

Doby Cleats Ltd TA Doby Verrolec manufacture the Tabbed Duct Access Doors in a variety of shapes and sizes. For this LCA, a weighted average based on 2023 production output relative to sales of all square Tabbed Duct Access Door types has been selected for modelling, and the average results are representative for the following products: 100mm x 100mm, 150mm x 150mm, 200mm x 200mm, 250mm x 250mm, 300mm x 300mm, 350mm x 350mm, 400mm x 400mm, 500mm x 500mm & 600mm x 600mm. The compositions of these products are all within 5% of each other, thereby meeting BRE's rules for producing a product average EPD. The mass balance for the Tabbed Duct access Doors was within tolerance, and no uplift of the input materials was required to cover production output and waste.

The quality level of geography, time and technological representativeness is Very Good as specific UK datasets have been selected from the ecoinvent LCI, and the background LCI datasets are from ecoinvent v3.8 which was compiled in 2021. Therefore, the most appropriate LCA data have been used. The GWP of the electricity dataset used for this EPD is: 1 kWh UK electricity = 2.39E-01 kgCO2eq (Electricity GB (kWh) market for electricity, medium voltage). The GWP of the natural gas dataset used for this EPD is: 1 kWh UK natural gas = 2.32E-01 kgCO2eq (Natural gas, at industrial furnace kWh, GB).

Cut-off criteria

All raw materials and energy inputs to the manufacturing process have been included except for ancillary materials, which are not used in the manufacturing process, and direct emissions to air, water and soil, which are not measured. The inventory process in this LCA includes all data related to raw materials, packaging material and consumable items. Process energy, water use and discharge, and waste emissions are also included. There was no Ecoinvent 3.8 dataset for PVC foam available, so polyurethane flexible foam was used instead as a proxy. Furthermore, the foam gasket makes up a negligible proportion of the product by mass (less than 1%).

After reviewing the expanded polystyrene input material dataset, it was determined that the generic pre-existing recycled content was negligible at 0.01%. It has therefore been assumed that the full quantity of polystyrene can be claimed for module D energy recovery benefits. Furthermore, since the rigid polyurethane gasket makes up a negligible proportion of the product by mass (less than 1%), and its generic end-of-life scenario matches

that of the polystyrene (100% to incineration with energy recovery according to the BRE PCR PN514 v3.1), its mass can be included with the mass of polystyrene sent to energy recovery.

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	4.28E+00	4.25E+00	1.76E-02	3.92E-03	2.36E-07	5.47E-02	2.01E-03
	Transport	A2	8.54E-02	8.52E-02	1.00E-04	4.00E-05	1.91E-08	4.29E-04	7.35E-06
	Manufacturing	A3	4.66E-02	5.22E-02	-5.70E-03	3.75E-05	3.88E-09	1.42E-04	6.96E-06
	Total (Consumption grid)	A1-3	4.41E+00	4.39E+00	1.20E-02	4.00E-03	2.59E-07	5.53E-02	2.03E-03
Construction process stage	Transport	A4	1.32E-02	1.32E-02	1.13E-05	5.19E-06	3.06E-09	5.36E-05	8.51E-07
	Construction	A5	8.61E-03	8.33E-04	7.78E-03	1.84E-07	2.81E-11	2.47E-06	8.12E-08
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	1.32E-02	1.32E-02	1.13E-05	5.19E-06	3.06E-09	5.36E-05	8.51E-07
	Waste processing	C3	1.75E-01	1.75E-01	3.19E-05	8.79E-06	1.83E-08	8.99E-04	2.75E-06
	Disposal	C4	4.12E-04	4.11E-04	4.08E-07	3.88E-07	1.66E-10	3.87E-06	3.77E-08
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	-1.73E+00	-1.74E+00	5.24E-03	-5.37E-04	-7.05E-08	-6.28E-03	-6.76E-04

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

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

LCA Results (continued)

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

Parameters describing environmental impacts									
			EP-marine	EP-terrestrial	POCP	ADP-mineral &metal	ADP-fossil	WDP	PM
			kg N eq	mol N eq	kg NMVOC eq	kg Sb eq	MJ, net calorific value	m^3 world eq deprived	disease incidence
Product stage	Raw material supply	A1	5.66E-03	2.01E-01	1.89E-02	1.56E-04	4.87E+01	2.15E+00	6.74E-07
	Transport	A2	1.26E-04	1.38E-03	4.23E-04	5.47E-07	1.28E+00	6.65E-03	7.65E-09
	Manufacturing	A3	4.21E-05	4.44E-04	1.44E-04	1.95E-07	1.21E+00	1.39E-02	1.78E-09
	Total (Consumption grid)	A1-3	5.83E-03	2.02E-01	1.94E-02	1.57E-04	5.12E+01	2.17E+00	6.84E-07
Construction process stage	Transport	A4	1.62E-05	1.77E-04	5.41E-05	4.59E-08	2.00E-01	8.99E-04	1.14E-09
	Construction	A5	1.44E-05	1.14E-05	3.20E-06	5.22E-10	2.94E-03	2.11E-04	2.56E-11
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	1.62E-05	1.77E-04	5.41E-05	4.59E-08	2.00E-01	8.99E-04	1.14E-09
	Waste processing	C3	3.99E-04	4.36E-03	1.20E-03	4.61E-08	1.18E+00	3.04E-03	2.38E-08
	Disposal	C4	1.34E-06	1.47E-05	4.28E-06	9.38E-10	1.15E-02	5.27E-04	7.79E-11
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	-1.49E-03	-1.58E-02	-8.60E-03	-1.39E-06	-1.82E+01	-1.29E-01	-1.14E-07

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

LCA Results (continued)

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

Parameters describing environmental impacts							
			IRP	ETP-fw	HTP-c	HTP-nc	SQP
			kBq U^{235} eq	CTUe	CTUh	CTUh	dimensionless
Product stage	Raw material supply	A1	2.42E-01	1.66E+02	2.99E-08	1.62E-07	1.49E+01
	Transport	A2	6.89E-03	1.07E+00	6.00E-11	1.19E-09	7.87E-01
	Manufacturing	A3	1.68E-02	4.34E-01	2.15E-11	3.00E-10	7.77E-01
	Total (Consumption grid)	A1-3	2.66E-01	1.67E+02	3.00E-08	1.63E-07	1.64E+01
Construction process stage	Transport	A4	1.03E-03	1.56E-01	5.05E-12	1.63E-10	1.37E-01
	Construction	A5	3.19E-05	5.00E-03	1.66E-12	6.46E-12	4.05E-03
End of life	Deconstruction, demolition	C1	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Transport	C2	1.03E-03	1.56E-01	5.05E-12	1.63E-10	1.37E-01
	Waste processing	C3	5.30E-03	7.60E-01	3.24E-11	7.01E-10	1.52E-01
	Disposal	C4	5.10E-05	7.25E-03	1.84E-13	4.77E-12	2.41E-02
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	-6.93E-02	-5.12E+01	-9.07E-09	-3.51E-08	-3.76E+00

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	4.08E+00	0.00E+00	4.08E+00	4.69E+01	1.24E+00	4.81E+01
	Transport	A2	2.13E-02	0.00E+00	2.13E-02	1.20E+00	0.00E+00	1.20E+00
	Manufacturing	A3	1.62E-01	6.54E-02	2.27E-01	1.16E+00	2.07E-01	1.37E+00
	Total (Consumption grid)	A1-3	4.26E+00	6.54E-02	4.32E+00	4.93E-01	1.45E+00	5.07E+01
Construction process stage	Transport	A4	2.81E-03	0.00E+00	2.81E-03	1.96E-01	0.00E+00	1.96E-01
	Construction	A5	-6.77E-02	6.77E-02	4.78E-05	-1.93E-01	1.96E-01	2.23E-03
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	2.81E-03	0.00E+00	2.81E-03	1.96E-01	0.00E+00	1.96E-01
	Waste processing	C3	6.74E-03	0.00E+00	6.74E-03	7.41E-02	1.08E+00	1.16E+00
	Disposal	C4	9.79E-05	0.00E+00	9.79E-05	1.13E-02	0.00E+00	1.13E-02
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	-5.54E-01	0.00E+00	-5.54E-01	-1.81E+01	0.00E+00	-1.81E+01

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	6.31E-01	0.00E+00	0.00E+00	5.28E-02
	Transport	A2	0.00E+00	0.00E+00	0.00E+00	1.65E-04
	Manufacturing	A3	2.86E-04	3.95E-07	0.00E+00	4.04E-04
	Total (Consumption grid)	A1-3	6.31E-01	3.95E-07	0.00E+00	5.34E-02
Construction process stage	Transport	A4	0.00E+00	0.00E+00	0.00E+00	2.23E-05
	Construction	A5	0.00E+00	0.00E+00	0.00E+00	5.00E-06
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	2.23E-05
	Waste processing	C3	0.00E+00	0.00E+00	0.00E+00	7.46E-05
	Disposal	C4	0.00E+00	0.00E+00	0.00E+00	1.23E-05
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	0.00E+00	0.00E+00	0.00E+00	-3.15E-03

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	1.47E+00	7.37E+00	1.05E-04
	Transport	A2	1.68E-03	3.13E-02	2.04E+00
	Manufacturing	A3	1.50E-03	3.22E-02	5.40E-06
	Total (Consumption grid)	A1-3	1.47E+00	7.43E+00	2.04E+00
Construction process stage	Transport	A4	2.20E-04	3.91E-03	1.35E-06
	Construction	A5	3.12E-05	1.14E-02	1.07E-08
End of life	Deconstruction, demolition	C1	0.00E+00	0.00E+00	0.00E+00
	Transport	C2	2.20E-04	3.91E-03	1.35E-06
	Waste processing	C3	2.07E-03	3.99E-02	8.10E-06
	Disposal	C4	1.19E-05	1.69E-04	7.53E-08
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	-1.59E-01	-3.25E+00	-2.79E-05

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

LCA Results (continued)

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

Other environmental information describing output flows – at end of life								
			CRU	MFR	MER	EE	Biogenic carbon (product)	Biogenic carbon (packaging)
			kg	kg	kg	MJ per energy carrier	kg C	kg C
Product stage	Raw material supply	A1	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Transport	A2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Manufacturing	A3	0.00E+00	6.68E-06	3.63E-09	3.31E-04	0.00E+00	-1.90E-03
	Total (Consumption grid)	A1-3	0.00E+00	6.68-06	3.63E-09	3.31E-04	0.00E+00	-1.90E-03
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	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
End of life	Deconstruction, demolition	C1	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Transport	C2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Waste processing	C3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Disposal	C4	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

CRU = Components for reuse;
MFR = Materials for recycling

MER = Materials for energy recovery;
EE = Exported Energy

Scenarios and additional technical information

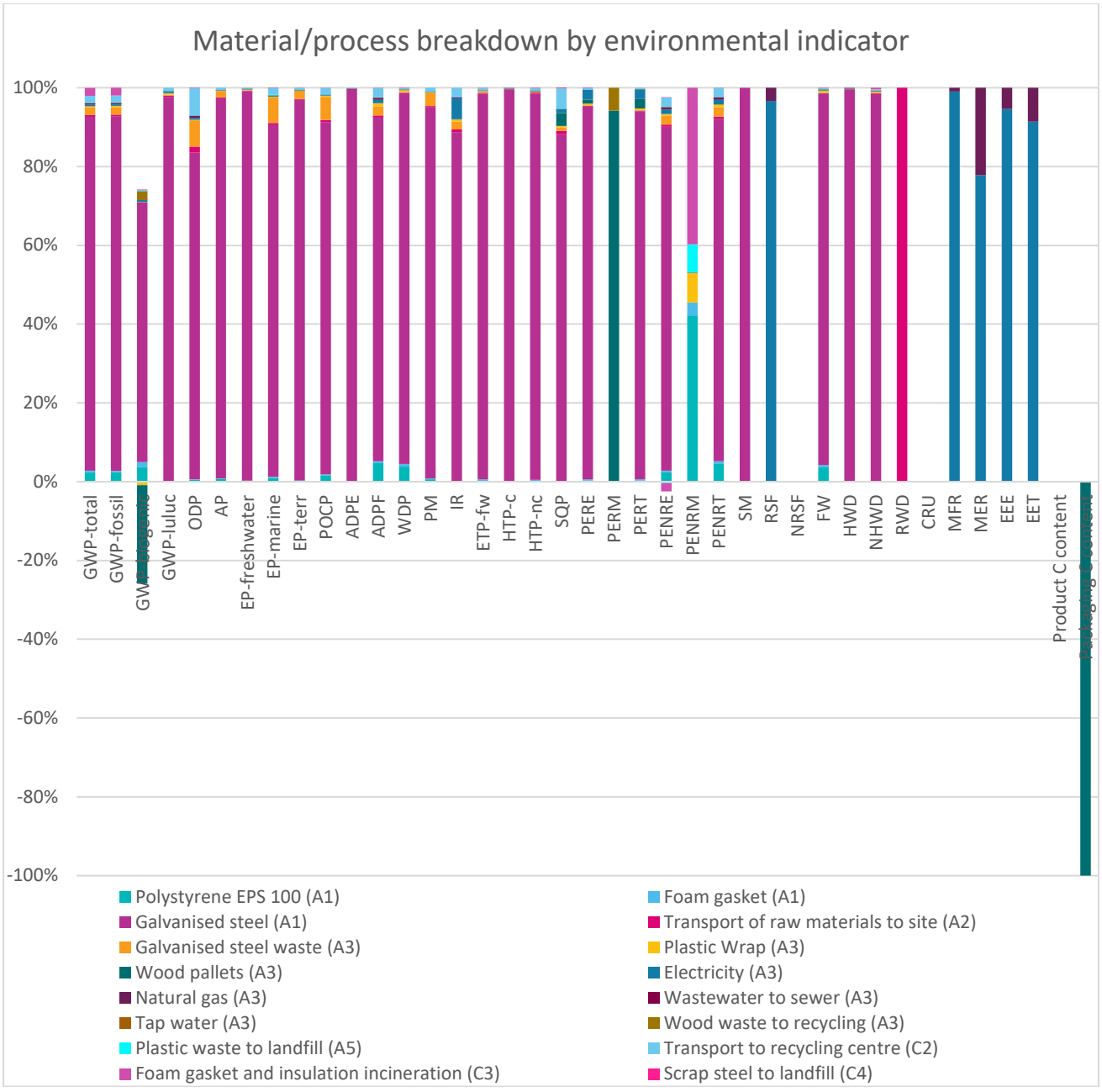
Scenarios and additional technical information			
Scenario	Parameter	Units	Results
A4 – Transport to the building site	Lorry 16-32 tonne transports the product (Tabbed Duct Access Doors) via local haulage companies in which they transport the product along with other made products from Doby Cleats Ltd TA Doby Verrolec to sites/ customers all across the UK. A generic transport to site distance of 50 km has been selected as a reasonable average. End-users of the EPD can use this information to calculate a bespoke transport to site distance if required, i.e. divide the module A4 impacts by 50 and multiply them by a chosen distance.		
	Lorry 16-32 tonne	Litres of diesel per km	0.227
	Distance:	km	50
	Capacity utilisation (incl. empty returns)	%	26
	Bulk density of transported products	kg/pallet	167
A5 – Installation in the building	Plastic wrap waste to landfill (per unit)	kg	0.00635
	Wooden pallets to recycling	kg	0.00484
C1 – Deconstruction	Deconstruction of the product will consist of simple removal from HVAC ductwork system in the reverse way of installation. Unclipping/ bending the metal tabs will loosen the Tabbed Duct Access door from its hold within the ductwork and the foam gasket is stripped from the Tabbed Duct Access door by hand. The polystyrene infill will simply come out of the body of the door by unclipping the cam locks and with some gentle manual help. The remaining parts of the door are all galvanised steel. The body, lid, retaining wire and locking cams (all the metal components) will go to a local recycling unit that the customer/contractor decides upon based on their location. 100% recovery for the waste product from the demolition site. There is no use or need for materials, energy, water etc. for installation or removal purposes. A possible tool for installation would be a hammer. For deconstruction, a claw hammer or a screwdriver, i.e. a tool that can simply unbend and lift up the metal tabs to loosen its hold within the HVAC ductwork.		
C2 - Transport	Doby Cleats Ltd TA Doby Verrolec sell products to customers all over the UK. Local haulage companies collect the products and distribute them to customers using a 16-32 lorry, who in turn then may distribute the product further to a site or customer etc. for the installation of the Tabbed Duct Access Door. Therefore, 50 km has been selected as a reasonable average distance to site, and if required, the end user of the EPD can calculate impacts for a bespoke distance by dividing the C2 impacts by 50 and multiplying them by whatever distance they choose. Doby Cleats Ltd TA Doby Verrolec do not know where the old/ replaced Tabbed Duct Access Doors will be sent/ go for their end-of-life destination i.e. recycling centres. However, Doby Cleats Ltd TA Doby Verrolec do advise and tell customers that materials are recyclable for which it is their responsibility to carry out that process.		
	Distance:	km	50

Scenarios and additional technical information			
Scenario	Parameter	Units	Results
C3 – Waste Processing	There are no pre processing activities that the steel components of the product undergo before being sent to recycling centres. The Tabbed Duct Access Door is simply removed by a hand tool i.e. claw hammer, screw driver which is used to loosen the metal tabs that had been hammered down in the installation process to fix the Tabbed Duct Access Door into place. By doing so the door will become loose from its hold with the HVAC ductwork. There is no need or requirement for the use of energy i.e. electric for equipment or materials since it is a simple installation and removal process for the product. Once the product has been removed, it is the responsibility of the Contractor to decide where they send the components. Doby Cleats Ltd TA Doby Verrolec advise that the body, lid, cam locks retaining wire can all be recycled since they are all manufactured from galvanised steel. The removed foam gasket and EPS insulation will be stripped from the body and sent to incineration with energy recovery (0.024 kg + 0.004 kg = 0.028 kg). The Gasket accounts for less than 1% of the composition of the product. The BRE PCR generic end of life scenario for steel confirms that 95% will go to recycling and 5% will go to landfill. With the mass of the EPS insulation and gasket removed from the total mass of the product (1.59 kg - 0.024 kg insulation - 0.004 kg gasket = 1.56 kg), the quantity of steel available for recycling can be calculated as 1.48 kg (1.56 x 0.95).		
	Steel waste to recycling	kg	1.484
	Polystyrene waste to incineration	kg	0.028
C4 - Disposal	Quoting appendix D of BRE PCR document, the generic end of life scenario for steel and insulation (rigid sheet) EPS best suits the Tabbed Duct Access Doors product. Galvanised steel products will be sent to metal waste recycling units chosen by the customer/contractors in their local area. The EPS insulation and foam gasket will be sent to an incineration plant chosen by the customer/contractor in their local area. According to the BRE PCR generic end-of-life scenario for steel, 5% cannot be separated from other components or isn't suitable for recycling, so will go to landfill. With the mass of the insulation and gasket removed from the total unit mass, the total mass send to landfill was calculated as 0.0781 kg (1.56 kg x 5%).		
	Steel waste to landfill	kg	0.0781

Scenarios and additional technical information			
Scenario	Parameter	Units	Results
Module D	A generic pre-existing recycled content of 0.573 kg per 1 kg of stainless steel has been sourced from the Ecoinvent 3.8 stainless steel dataset used in this LCA. With the mass of the EPS insulation and gasket removed (1.57 kg - 0.32 kg insulation - 0.12 kg gasket = 1.13 kg), and the BRE PCR generic end-of life scenario for steel at 95% to recycling applied, the pre-existing recycled content of stainless steel per unit can be calculated as 0.615 kg (1.13 x 0.95 x 0.573). This mass has been removed from the module D calculation in order to avoid the double-counting of environmental benefits. The dataset used to calculate the benefits of recycling steel was 'Pig iron {RER}| pig iron production | EN15804, S'. After reviewing the expanded polystyrene input material dataset, it was determined that the generic pre-existing recycled content was negligible at 0.01%. It has therefore been assumed that the full quantity of polystyrene can be claimed for module D energy recovery benefits. Furthermore, since the foam gasket makes up a negligible proportion of the product by mass (less than 1%), and it's generic end-of-life scenario matches that of the polystyrene (100% to incineration with energy recovery according to the BRE PCR PN514 v3.1), its mass can be included with the mass of polystyrene sent to energy recovery (0.32 kg + 0.12 kg = 0.44 kg). The calorific value of EPS insulation is 46 MJ/kg (British Plastic Federation, 2024), and during incineration, 37.4% of combustion heat is recovered for electricity generation, meaning that the electricity generated from 1 kg of EPS will be 17.2 MJ. It has been assumed that the EPS and foam gasket will be incinerated in the UK, therefore the dataset used to calculate the avoided impacts of electricity consumption in a future system was 'Electricity, medium voltage {GB}| market for | Alloc Def, U'. The efficiency rate of 37.4% has been calculated by taking a weighted average of the number of waste incineration plants available in the UK. According to the Environmental Agency's 2013 article on "CHP Ready Guidance for Combustion and Energy from Waste Power Plants" in the UK, EFW plants have an efficiency of 33%, and CHP plants have an efficiency of 55%. Additionally, according to Azapagic, A., & Jeswani, H. K. (2016), there are currently 25 MSW incinerators with energy recovery in the UK. It is assumed that 20 plants generate heat and power at 33%, while 5 plants generate electricity at 55%. Therefore, the weighted average calculation is used to determine the efficiency, which is calculated at 37.4%.		
	Product's Recycled Content (post-consumer)	kg	0.56
	Recovered for recycling	kg	1.003
	Recovered for energy	kg	0.028

Interpretation

The LCA results show that the bulk of the environmental impacts and primary energy demand are attributed to the manufacturing phase, covered by information modules A1-A3 of EN 15804:2012+A2:2019. The process contribution graph shows that the vast majority of the impacts across the indicators are associated with the upstream manufacturing of the galvanised steel input material. Wooden pallets are attributable to almost all the impact in the PERM indicator, although have a positive impact in the GWP biogenic and Packaging C content indicators. Polystyrene EPS 100 and Foam Gasket/Insulation incineration account for the majority of impact in the PENRM indicator. Finally, Electricity and Transport of raw materials to site make up almost all of the impacts within the RSF and RWD indicators (respectively).



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