Environmental Product Declaration

In accordance with ISO 14025 ad EN 15804:2012+A2:2019

[*Door Systems*]

EPD registration number:	**S-P-04379**
Publication date:	**2021-10-25**
Validity date:	**2026-10-24**
Geographical scope:	**Worldwide**

1. Introduction

Kubik India Pvt Limited (Kubik) is engaged in the supply, and installation of customized modular aluminium framed office partition systems & doors. Door Systems available in single glazed or double glazed, details provided in Table 1. The company offers its clients diversified & latest design products with high quality. Protecting the environment has always been the primary focus of Kubik since 2015.

Kubik has been designing and installing Doors in some of the most prestigious architectural projects across India. Kubik has serviced a high-profile clientele that includes some of the biggest international brands and brings on board an unmatched reputation for innovation and excellence. The mission of Kubik is to serve their customers with innovative & futuristic products, providing **privacy, aesthetics, acoustics and value** to a workplace with compassion, dedication and honesty.

This Environment Product Declaration (EPD) is for Door Systems having 7 different configurations.

2. General Information

2.1 EPD, PCR, LCA Information

Table 1: EPD Information

Programme	The International EPD® System, Indian Regional Hub www.environdec.com and www.envirodecindia.com
Program operator	EPD International AB Box 210 60, SE-100 31 Stockholm, Sweden.
Declaration holder	KUBIK INDIA PVT LTD C-8/9/10, hind saurashtra industrial estate, marol naka, near mittal industrial, andheri-kurla road, andheri east, mumbai, maharashtra, india 400 059.
Product	Room Doors
CPC Code	4212 (Version 1.1)
EPD registration number	S-P-04379
Publication date	2021-10-25
Validity date	2026-10-24
Geographical scope	India
Reference standards	ISO 14025:2006, ISO 14040/44, EN 15804:2019 +A2

Table 2: PCR Information

Reference PCR	PCR CONSTRUCTION PRODUCTS' Version 1.11, 2019:14
Date of Issue	2021-02-05 (Valid until 2024-12-20)

Table 3: Verification Information

Demonstration of verification	External, independent verification
Third party verifier	Dr Hüdai Kara, Metsims Sustainability Consulting, 4 Clear Water Place, Oxford OX2 7NL, UK Email: hudai.kara@metsims.com

Table 4: LCA Information

Title	Environmental Product Declaration of Room Door System
Preparer	Dr. Rajesh Kumar Singh thinkstep Sustainability Solutions - a Sphera Company 707, Meadows, Sahar Plaza, Andheri Kurla Road, Andheri East, Mumbai - 400059, India Email: rsingh@sphera.com

2.2 Reference Period of EPD Data

The reference period for the data used within this EPD is May 2020 - June 2021.

2.3 Geographical Scope of EPD Application

The geographical scope of this EPD is Worldwide.

2.4 Additional Information about EPD

This EPD provides information for room Door system with 7 configurations. The EPD is in accordance with ISO 14025. The Life Cycle Assessment (LCA) study carried out for developing this EPD for Door Systemas per ISO 14040 and ISO 14044 requirements

The PCR CONSTRUCTION PRODUCTS Version 1.11, 2019:14, being compliant with ISO 14025, ISO 14040 and ISO 14044 was used to conduct the assessment. The LCA was carried out using Cradle to Grave approach, according to the identified PCR using Sphera Solutions Inc.'s GaBi (v10) software.

3. Product Description and System Boundaries

The Door Assembly has 7 choices in which all of them have a similar configuration. Each of the door assemblies is made of aluminium extrusion profile, glass, steel, door hardwares and plastics. Glass may be either Toughened, Laminated or Annealed glass. The model number, name and product image of different door assemblies are provided in Table 1. The range of percentage material content of the door system, product weight is provided in Table 2.

The declared unit is a reference for the product whose life cycle impact is being assessed. The declared unit allows quantification of the environmental impacts of Door product over Cradle-to-Grave life cycle stage. These environmental impacts are calculated based on the declared unit wherein each flow related to material consumption, energy consumption, emissions, effluent, and waste is scaled to the reference flow.

The declared unit is 1 piece of Door assembly that is 1 m wide and 2.7 m height opening door and Glass thickness of 10 mm with varying dimensions of standard track section, weight of material used.

Table 1 Door System Models (Configurations)

Door System Configuration	Name	Product Mass (kg)	Product Description	Product Image
Model 1	Acosoft 40 Sliding Door (Single Glazed)	69.17	Acosoft Sliding door is the unique solution for acoustic in sliding door with track dimension 35mm x 37mm. Special design sliding lock with minimum noise ensuring safety and strength with aesthetic appeal. Soft closing ensures smooth movement during opening as well as parking the door (Both ends). Automatic Drop down seal to increase sound insulation capacity. The Brooklyn option is available. Glass thickness : Toughened : 10mm & 12mm and Laminated : 11.52mm. Maximum height 2.7 m & Maximum Width 1050mm. **Sound Insulation Capacity upto 30 dB**. Single Glazed Door System. Ready Available Finish : Silver Anodized & Black Anodized	
Model 2	Glass Door (Single Glazed)	75.837	Glass door series is a single glass door system with Kubik Hinges & Kubik Handles, compatible with European or equivalent hardwares. Open door closers are applicable & Glass thickness : 10mm / 12mm. Maximum height 2.7 m & Maximum Width 1050mm. **Sound Insulation Capacity upto 25 dB**	 

Model 3	Stile 35 (Single Glazed)	79.74	Stile 35 is the slimmest of all available stile doors on invisible Kubik Pivots. Key Features (1) Dimension 45mm x 35mm (2) High acoustic performance (3) Compatible to European or equivalent hardware (4) With drop down seal in slimmest stile (5) Brooklyn possible (6) Compatible with Open Door Closer (7) Magnetic lock body (8) Glass thickness : Toughened 10mm/ 12mm & Laminated 11.52mm (9) Maximum height 2.7 m & Maximum Width 1050mm. **Sound Insulation Capacity upto 33 dB**. Single Glazed Door System. Ready Available Finish : Silver Anodized & Black Anodized	
Model 4	Stile 60 (Single Glazed)	72.158	Stile 60 door series is a 60mm x 35mm single glaze door system with Kubik Hinges & Kubik Handles, compatible with European hardware. Open door closer is applicable & suitable for heavy flow traffic areas. Glass thickness : Toughened 10mm/ 12mm & Laminated 11.52mm. Maximum height 2.7 m & Maximum Width 1050mm**.Sound Insulation Capacity upto 30 dB**. Single Glazed Door System. Ready Available Finish : Silver Anodized & Black Anodized	
Model 5	Stile 75 DG (Double Glazed)	76.243	Stile 75 DG door series is a 75mm x 45mm double glaze door system with Kubik Hinges & Kubik Handles, compatible with European hardware. Open & Concealed both door closers are applicable & Brooklyn series is available. Glass thickness : 5mm only. Maximum height 2.7 m & Maximum Width 1050mm. **Sound Insulation Capacity upto 32 dB**. Double Glazed Door System. Ready Available Finish : Silver Anodized & Black Anodized	

Model 6	Stile 75 (Single Glazed)	75.53	Stile 75 door series is a 75mm x 45mm single glaze door system with Kubik Hinges & Kubik Handles, compatible with European hardware. Open & Concealed both door closers are applicable & Brooklyn series is available. Glass thickness : Toughened 10mm / 12mm & Laminated 11.52mm. Maximum height 2.7 m & Maximum Width 1050mm. **Sound Insulation Capacity upto 30 dB**. Single Glazed Door System. Ready Available Finish : Silver Anodized & Black Anodized	
Model 7	Stile 100 (Single Glazed)	69.42	Stile 100 door series is a 100mm x 45mm single glaze door system with Kubik Hinges & Kubik Handles, compatible with European hardware. Open & Concealed both door closers are applicable & Brooklyn series is available. Glass thickness : Toughened 10mm / 12mm & Laminated 11.52mm. Maximum height 2.7 m & Maximum Width 1050mm. **Sound Insulation Capacity upto 30 dB**. Single Glazed Door System. Ready Available Finish : Silver Anodized & Black Anodized	 

Table 2 Materials by % mass for Door System Model

Material	% Distribution (Single Glazed)	%Distribution (Double Glazed)	%Recycled Content
Aluminium	13-28	27	32
Glass	61-77	62	7
Other material	10-12	11	56
Total	100	100	

4. LCA

4.1 Information Sources and Data Quality

Kubik India Pvt. Ltd. provided primary data with a very high data quality for their room Door products. The quality of the LCI data for modelling the life cycle stages, assessed according to ISO 14044 (2006) is judged by its precision (measured, calculated or estimated), completeness (e.g. are there unreported emissions), consistency (degree of uniformity of the methodology applied on an LCA serving as a data source) and representativeness (geographical, time period, technology). To achieve this, industry data collected directly from the producers were used wherever possible. All upstream LCA data from the GaBi 10.5 Professional database from Sphera Solutions Inc.

4.2 Methodological Details

4.2.1 Declared unit

The declared unit is 1 piece of Door assembly 1 m wide and 2.7 m height opening door and Glass thickness of 10 mm)

4.2.2 Selection of application of LCIA categories

A list of relevant impact categories and category indicators is defined and associated with the inventory data. The methods that have been selected for evaluation of environmental impacts are mentioned in (Table 4). These indicators are scientifically and technically valid.

The environmental impact per declared unit for the following environmental impact categories were reported in the EPD according to the mentioned PCR in modular format of A-D. EN 15804:2012+A2:2019 specifies 'IPCC (2013)' (AR5) as the reference for the GWP indicator. The same has been used and documented below.

Table 3 Environmental Impacts Indicators

Impact Indicator	LCIA Method	Unit
Global Warming Potential (GWP-total)	IPCC 2013	kg CO_2 equivalent
Global Warming Potential (GWP-fossil)	IPCC 2013	kg CO_2 equivalent
Global Warming Potential (GWP-biogenic)	IPCC 2013	kg CO_2 equivalent
Global Warming Potential land use and land use change (GWP-luluc)	IPCC 2013	kg CO_2 equivalent
Acidification Potential	CML	mol SO_2 equivalent
Eutrophication Potential (EP-freshwater)	CML	kg P equivalent
Photochemical Ozone Creation Potential	CML	kg ethene equivalent
Abiotic depletion potential – Elements	CML	kg Sb equivalent

Abiotic depletion potential – Fossil fuels	CML	MJ, net calorific value
Water scarcity potential	AWARE 2016	m^3 world equivalent deprived

Table 4 Resources Use Parameters

Parameter	Unit
Primary energy resources – Renewable	MJ, net calorific value
Primary energy resources – Non-Renewable	MJ, net calorific value
Secondary Material	kg
Renewable secondary fuels	MJ, net calorific value
Non-renewable secondary fuels	MJ, net calorific value
Net use of fresh water	m^3

The consumption of resources declared per function unit is reported in the EPD. Input parameters, describing resource use are shown in Table 4.

Table 5 Optional Environmental Indicators

Parameter	Unit
Human toxicity, cancer (recommended and interim)	cases
Human toxicity, non-canc. (recommended and interim)	cases
Fresh water ecotoxicity (recommended and interim)	PAF.m^3.day
Land Use	species. yr

Table 6 Waste Categories

Waste categories	Unit
Hazardous waste disposed	kg
Non-hazardous waste disposed	kg
Radioactive waste disposed/stored	kg

Table 7 Indicators describing the output flows

Parameter	Unit
Components for reuse	kg
Material for recycling	kg
Materials for energy recovery	kg
Exported energy, electricity	MJ
Exported energy, thermal	MJ

4.3 Cut-off Criteria

Input and output data have been collected through detailed questionnaires which have been developed and refined. In practice, this means that, at least, all material flows going into the production processes

(inputs) higher than 1% of the total mass flow (t) or higher than 1% of the total primary energy input (MJ) are part of the system and modelled in order to calculate elementary flows. Inputs with less than 1% of mass flow and less than 1% of the total primary energy input are also considered as all these were environmentally relevant.

4.4 Allocation

No allocation has been done. As no co-products are produced, the flow of materials and energy and the associated release of substances and energy into the environment is related exclusively to the Entropy model produced. Any allocation performed in the background processes is according to the PCR.

4.5 System Boundaries

The system boundary for Door System represents a Cradle-to-Grave, which covers production Phase, packaging phase and End of life phase. The production phase includes the raw material extraction, production of the raw materials, auxiliary material production, upstream transportation, manufacturing process of the final product and its packaging. End of life phase includes waste processing for reuse, recovery or recycling and disposal.

Table 8 Details of system boundary included in the study

EPD Module	Life Cycle Stages	Life Cycle Sub-stages	Definitions
A1	Materials	Primary raw material production	Extraction and production of raw material in the upstream
A2	Upstream Transport	-	Transport of raw material to the assembly site
A3	Manufacturing	Assembly of door	Assembly of raw material to form packed door product i.e. aluminium extrusion profile, glass, steel cold rolled coil, fixing material screws and packing material like plastic film, plastic foil and corrugated paper
A4	Transport	-	Transport of packed door to installation site
A5	Installation	-	Separation of packaging material and installation of partition system
C1	Deconstruction and demolition	-	Considered to be zero as manual separation of parts of partition system is considered
C2	Transport	-	With a collection rate of 100%, the transports are carried out by truck over 50 km
C3	Waste Processing	Segregation	Separation of aluminium, steel, plastic and inert matter to landfill and end of life treatment
C4	Disposal	-	Material not getting recycled is considered for landfill. Thus 5% of aluminium is considered for landfill as 95% is considered for credit and 15% of steel is considered for landfill as 85% is considered for credit
D	EOL Credit	-	Aluminium and Steel is 100% recyclable material and as per World Steel Data 85% recoverability is observed while as per IAI global bench mark the recycling rate is 98.5%. Thus 85% of steel and 95% is of aluminium is considered for EOL credit

4.5.1 Geographic System Boundaries

The geographical coverage of this declaration covers the production of all the 7 models of room Door India. Wherever possible, the country specific (India) boundaries have been adapted and other datasets were chosen from EU if no Asian Countries datasets were available

4.5.2 Temporal System Boundaries

The data collection is related to one year of operation and the year of the data is indicated in the questionnaire for each data point. The majority of data was derived for the year 2020-21 (May 2020 to June 2021) and is believed to be representative of production of product 'Room Door' in India during this time frame.

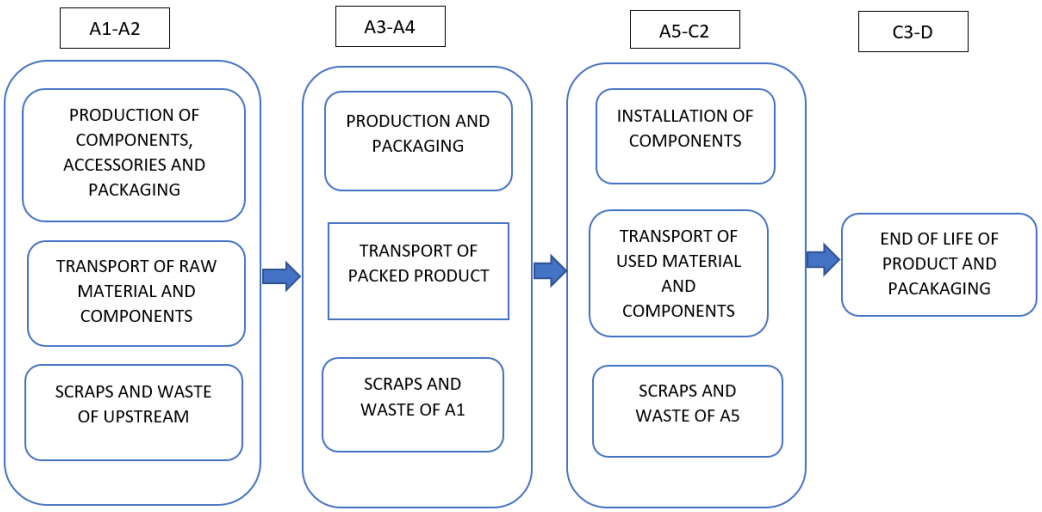

Figure 1 Details of System Boundary for Door System

4.5.3 Technology coverage

The exact technological configuration was used for the various process's operation of its plant for efficient performance in production and minimizing environmental impacts. It was assumed that secondary data from databases that were used for this assessment, were temporally and technologically comparable to that of primary data and within the temporal coverage already addressed.

4.6 Software and database

The LCA model was created using the GaBi 10 Software system for life cycle engineering, developed by Sphera Solutions. The GaBi database provides the life cycle inventory data for several of the raw and process materials obtained from the upstream system. Detailed database documentation for GaBi datasets can be accessed at http://www.gabi-software.com/international/support/gabi/gabi-database-2020-lci-documentation.

4.7 Comparability

According to the standards, EPDs do not compare the environmental performance of products in the sector. Any comparison of the declared environmental performance of products lies outside the scope of these standards and is suggested to be feasible only if all compared declarations follow equal standard provisions.

4.8 Results

Modules of the production life cycle included as per PCR is given in Table

Table 9 Modules of Production life cycle included (X= Declared Module; MND = Module not declared)

Production			Installation		Use Stage							End of Life				Next Product System
Raw material supply (extrac-tion, processing, recycled mate-rial)	Transport to manufacturer	Manufacturing	Transport to building site	Installation into building	Use / application	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	Deconstruction / demolition	Transport to EoL	Waste processing for reuse, re-covery or recycling	Disposal	Reuse, recovery or recycling po-tential
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
X	X	X	X	X	MND	MND	MND	MND	MND	MND	MND	MND	X	X	X	X

The tables below show the life cycle environmental impacts for 1 piece of Door of 1.0 m wide and 2.7 m height opening door & Glass Thickness 10mm

4.8.1. Door System Model 1: The table below shows the LCIs, LCIAs Resource use, for ACOSOFT 40 Sliding Door (Single Glazed) Model 1 configuration.

Table 10 LCIA and LCI Result for Door System Model 1

Environmental impact indicators	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
Climate Change - total	[kg CO2 eq.]	5.19E+02	3.30E-01	5.98E+00	0	3.09E-01	3.11E+00	5.73E-02	-2.12E+02
Climate Change, fossil	[kg CO2 eq.]	5.23E+02	3.30E-01	-1.76E-01	0	3.09E-01	8.99E-01	1.50E-02	-2.12E+02
Climate Change, biogenic	[kg CO2 eq.]	-5.22E+00	1.80E-04	6.16E+00	0	1.68E-04	2.21E+00	4.23E-02	-4.53E-02
Climate Change, land use and land use change	[kg CO2 eq.]	7.26E-01	1.72E-05	-9.63E-04	0	1.61E-05	4.36E-04	7.49E-06	-3.41E-01
Ozone depletion	[kg CFC-11 eq.]	1.38E-10	2.71E-17	-1.18E-15	0	2.54E-17	3.24E-15	5.69E-17	-6.16E-13
Acidification	[Mole of H+ eq.]	5.74E+00	3.70E-03	-4.84E-03	0	3.47E-03	6.31E-03	1.12E-04	-2.52E+00
Eutrophication, freshwater	[kg P eq.]	5.34E-04	6.98E-08	3.93E-05	0	6.53E-08	2.44E-05	7.15E-08	-1.51E-04
Eutrophication, marine	[kg N eq.]	7.31E-01	1.74E-03	3.11E-04	0	1.63E-03	1.66E-03	2.94E-05	-2.77E-01
Eutrophication, terrestrial	[Mole of N eq.]	8.07E+00	1.91E-02	-1.11E-03	0	1.79E-02	1.81E-02	3.22E-04	-3.04E+00
Photochemical ozone formation, human health	[kg NMVOC eq.]	2.08E+00	3.25E-03	1.36E-03	0	3.04E-03	5.68E-03	1.02E-04	-8.51E-01
Resource use, mineral and metals	[kg Sb eq.]	2.03E-04	4.36E-09	-1.63E-08	0	4.08E-09	6.55E-08	1.13E-09	-4.39E-05
Resource use, fossils	[MJ]	5.71E+03	4.38E+00	-6.88E-01	0	4.10E+00	1.17E+01	1.92E-01	-2.13E+03
Water use	[m³ world equiv.]	4.40E+01	9.96E-04	-4.09E-02	0	9.32E-04	7.73E-02	1.54E-03	-1.94E+01

Table 11 Resource use indicators Result for Door System Model 1

Resource use indicators	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
Use of renewable primary energy (PERE)	[MJ]	8.70E+02	1.43E-02	7.28E+01	0	1.34E-02	1.30E+00	2.29E-02	-3.08E+02
Primary energy resources used as raw materials (PERM)	[MJ]	6.48E+01		-7.34E+01	0				
Total use of renewable primary energy resources (PERT)	[MJ]	9.34E+02	1.43E-02	-6.88E-01	0	1.34E-02	1.30E+00	2.29E-02	-3.08E+02
Use of non-renewable primary energy (PENRE)	[MJ]	5.55E+03	4.38E+00	1.65E+01	0	4.10E+00	7.73E+01	1.92E-01	-2.13E+03
Non-renewable primary energy resources used as raw materials (PENRM)	[kg]	1.67E+02		-1.72E+01	0		-6.56E+01		
Total use of non-renewable primary energy resources (PENRT)	[MJ]	5.71E+03	4.38E+00	-6.89E-01	0	4.10E+00	1.17E+01	1.92E-01	-2.13E+03
Input of secondary material (SM)	[kg]	0	0	0	0	0	0	0	0
Use of renewable secondary fuels (RSF)	[m3]	0	0	0	0	0	0	0	0
Use of non-renewable secondary fuels (NRSF)	[MJ]	0	0	0	0	0	0	0	0
Use of net fresh water (FW)	[m^3]	1.64E+00	3.43E-05	-1.43E-03	0	3.21E-05	2.29E-03	4.40E-05	-6.74E-01

Table 12 Waste Categories and other indicators Result for Door System Model 1

Output flows and waste categories	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
Hazardous waste disposed (HWD)	[kg]	2.74E-06	2.02E-11	-7.94E-10	0	1.89E-11	1.18E-09	1.96E-11	-3.90E-07
Non-hazardous waste disposed (NHWD)	[kg]	9.15E+01	7.88E-05	3.60E+00	0	7.38E-05	5.07E+01	9.42E-01	-4.13E+01
Radioactive waste disposed (RWD)	[kg]	6.51E-02	9.50E-07	-3.73E-05	0	8.89E-07	9.93E-05	1.75E-06	-1.93E-02
Components for re-use (CRU)	[kg]	0	0	0	0	0	0	0	0
Materials for Recycling (MFR)	[kg]	0	0	0	0	0	0	0	0
Material for Energy Recovery (MER)	[kg]	0	0	0	0	0	0	0	0
Exported electrical energy (EEE)	[MJ]	0	0	0	0	0	0	0	0
Exported thermal energy (EET)	[MJ]	0	0	0	0	0	0	0	0
Other Indicators	**Unit**	**A1-A3**	**A4**	**A5**	**C1**	**C2**	**C3**	**C4**	**D**
Particulate matter	Disease incidences	8.71E-05	2.14E-08	-9.22E-08	0	2.00E-08	7.70E-08	1.37E-09	-4.14E-05
Ionising radiation, human health	kBq U235 eq.	7.80E+00	8.90E-05	-3.49E-03	0	8.33E-05	9.12E-03	1.60E-04	-1.77E+00
Ecotoxicity, freshwater	CTUe	2.50E+03	1.72E+00	3.43E+00	0	1.61E+00	1.79E+01	3.15E-01	-3.99E+02
Human toxicity, cancer	CTUh	1.49E-07	2.96E-11	1.18E-10	0	2.77E-11	8.87E-10	1.58E-11	-2.90E-08
Human toxicity, non-cancer	CTUh	5.44E-06	1.39E-09	1.67E-08	0	1.30E-09	9.86E-08	1.80E-09	-1.69E-06
Land Use	Pt	2.21E+03	1.89E-02	-1.00E+00	0	1.77E-02	1.35E+00	2.41E-02	-4.04E+02

4.8.2 Door System Model 2: The table below shows the LCIs, LCIAs Resource use, for Glass Door (Single Glazed) Model 2 configuration.

Table 13 LCIA and LCI Result for Door System Model 2

Environmental impact indicators	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
Climate Change - total	[kg CO2 eq.]	3.86E+02	6.77E-01	4.54E+02	0	6.77E-01	1.02E+01	7.79E-01	-1.18E+03
Climate Change, fossil	[kg CO2 eq.]	3.91E+02	6.76E-01	-1.34E+01	0	6.76E-01	6.85E+00	2.04E-01	-1.17E+03
Climate Change, biogenic	[kg CO2 eq.]	-5.30E+00	3.69E-04	4.67E+02	0	3.69E-04	3.35E+00	5.75E-01	-1.29E-01
Climate Change, land use and land use change	[kg CO2 eq.]	4.87E-01	3.53E-05	-7.31E-02	0	3.53E-05	2.83E-03	1.02E-04	-1.77E+00
Ozone depletion	[kg CFC-11 eq.]	5.55E-11	5.57E-17	-8.94E-14	0	5.57E-17	1.76E-14	7.73E-16	-3.31E-12
Acidification	[Mole of H+ eq.]	4.13E+00	7.60E-03	-3.67E-01	0	7.60E-03	3.25E-02	1.52E-03	-1.28E+01
Eutrophication, freshwater	[kg P eq.]	4.31E-04	1.43E-07	2.98E-03	0	1.43E-07	1.01E-03	9.72E-07	-8.02E-04
Eutrophication, marine	[kg N eq.]	5.67E-01	3.57E-03	2.36E-02	0	3.57E-03	8.25E-03	4.00E-04	-1.43E+00
Eutrophication, terrestrial	[Mole of N eq.]	6.29E+00	3.92E-02	-8.45E-02	0	3.92E-02	9.02E-02	4.37E-03	-1.57E+01
Photochemical ozone formation, human health	[kg NMVOC eq.]	1.54E+00	6.67E-03	1.03E-01	0	6.67E-03	2.55E-02	1.39E-03	-4.41E+00
Resource use, mineral and metals	[kg Sb eq.]	2.04E-04	8.94E-09	-1.23E-06	0	8.94E-09	4.14E-07	1.53E-08	-1.78E-03
Resource use, fossils	[MJ]	4.40E+03	8.98E+00	-5.22E+01	0	8.98E+00	9.59E+01	2.61E+00	-1.16E+04
Water use	[m³ world equiv.]	3.26E+01	2.04E-03	-3.10E+00	0	2.04E-03	-1.22E-02	2.09E-02	-1.23E+02

Table 14 Resource use Result for Door System Model 2

Resource use indicators	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
Use of renewable primary energy (PERE)	[MJ]	6.58E+02	2.93E-02	2.13E+01	0	2.93E-02	6.86E+00	3.11E-01	-1.62E+03
Primary energy resources used as raw materials (PERM)	[MJ]	6.48E+01		-7.34E+01	0				
Total use of renewable primary energy resources (PERT)	[MJ]	7.23E+02	2.93E-02	-5.21E+01	0	2.93E-02	6.86E+00	3.11E-01	-1.62E+03
Use of non-renewable primary energy (PENRE)	[MJ]	4.29E+03	8.98E+00	-3.50E+01	0	8.98E+00	1.38E+02	2.61E+00	-1.16E+04
Non-renewable primary energy resources used as raw materials (PENRM)	[kg]	1.20E+02		-1.72E+01	0		-4.20E+01		
Total use of non-renewable primary energy resources (PENRT)	[MJ]	4.40E+03	8.98E+00	-5.22E+01	0	8.98E+00	9.59E+01	2.61E+00	-1.16E+04
Input of secondary material (SM)	[kg]	0	0	0	0	0	0	0	0
Use of renewable secondary fuels (RSF)	[m3]	0	0	0	0	0	0	0	0
Use of non-renewable secondary fuels (NRSF)	[MJ]	0	0	0	0	0	0	0	0
Use of net fresh water (FW)	[m^3]	1.22E+00	7.05E-05	-1.08E-01	0	7.05E-05	3.48E-03	5.98E-04	-4.20E+00

Table 15 Waste categories and other indicators Result for Door System Model 2

Output flows and waste categories	Unit	A1	A2	A3	A4	A5	C1	C2	C3	C4	D
Hazardous waste disposed (HWD)	[kg]	9.11E-07	1.26E-10	9.14E-07	4.14E-11	-6.02E-08	0	4.14E-11	9.33E-09	2.66E-10	-1.89E-06
Non-hazardous waste disposed (NHWD)	[kg]	6.73E01	4.96E-04	-9.32E-01	1.62E-04	2.73E02	0	1.62E-04	1.51E02	1.28E01	-2.01E02
Radioactive waste disposed (RWD)	[kg]	5.59E-02	5.96E-06	5.99E-04	1.95E-06	-2.83E-03	0	1.95E-06	5.39E-04	2.37E-05	-1.03E-01
Components for re-use (CRU)	[kg]	0	0	0	0	0	0	0	0	0	0
Materials for Recycling (MFR)	[kg]	0	0	0	0	0	0	0	0	0	0
Material for Energy Recovery (MER)	[kg]	0	0	0	0	0	0	0	0	0	0
Exported electrical energy (EEE)	[MJ]	0	0	0	0	0	0	0	0	0	0
Exported thermal energy (EET)	[MJ]	0	0	0	0	0	0	0	0	0	0
Other Indicators	**Unit**	**A1**	**A2**	**A3**	**A4**	**A5**	**C1**	**C2**	**C3**	**C4**	**D**
Particulate matter	Disease incidences	5.95E-05	1.20E-07	-5.88E-07	4.39E-08	-6.99E-06	0	4.39E-08	3.79E-07	1.86E-08	-2.12E-04
Ionising radiation, human health	kBq U235 eq.	7.41E00	5.58E-04	1.14E-01	1.83E-04	-2.65E-01	0	1.83E-04	4.97E-02	2.18E-03	-8.17E00
Ecotoxicity, freshwater	CTUe	2.53E+03	1.08E+01	3.48E+01	3.52E00	2.60E+02	0	3.52E00	9.58E+01	4.27E00	-2.22E+03
Human toxicity, cancer	CTUh	2.23E-06	1.85E-10	1.43E-09	6.08E-11	8.92E-09	0	6.08E-11	4.42E-09	2.14E-10	-1.89E-07
Human toxicity, non-cancer	CTUh	3.65E-06	8.11E-09	2.09E-07	2.84E-09	1.27E-06	0	2.84E-09	3.73E-07	2.45E-08	-9.35E-06
Land Use	Pt	6.34E02	1.18E-01	1.23E03	3.88E-02	-7.60E01	0	3.88E-02	6.80E00	3.27E-01	-2.12E03

4.8.3 Door System Model 3: The table below shows the LCIs, LCIAs Resource use, Waste categories for Door System Model 3 STILE 35 (Single Glazed) configuration.

Table 16 LCIA and LCI Result for Door System Model 3

Environmental impact indicators	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
Climate Change - total	[kg CO2 eq.]	4.76E+02	7.28E-01	5.98E+00	0	6.75E-01	3.47E+00	6.45E-02	-2.10E+02
Climate Change, fossil	[kg CO2 eq.]	4.81E+02	7.28E-01	-1.76E-01	0	6.74E-01	9.54E-01	1.69E-02	-2.10E+02
Climate Change, biogenic	[kg CO2 eq.]	-5.24E+00	3.97E-04	6.16E+00	0	3.68E-04	2.51E+00	4.76E-02	-4.27E-02
Climate Change, land use and land use change	[kg CO2 eq.]	6.44E-01	3.80E-05	-9.63E-04	0	3.52E-05	4.69E-04	8.42E-06	-3.35E-01
Ozone depletion	[kg CFC-11 eq.]	5.59E-11	5.99E-17	-1.18E-15	0	5.55E-17	3.52E-15	6.40E-17	-6.07E-13
Acidification	[Mole of H+ eq.]	5.21E+00	8.18E-03	-4.84E-03	0	7.58E-03	6.89E-03	1.26E-04	-2.47E+00
Eutrophication, freshwater	[kg P eq.]	5.00E-04	1.54E-07	3.93E-05	0	1.43E-07	1.51E-05	8.05E-08	-1.49E-04
Eutrophication, marine	[kg N eq.]	6.77E-01	3.85E-03	3.11E-04	0	3.56E-03	1.81E-03	3.31E-05	-2.73E-01
Eutrophication, terrestrial	[Mole of N eq.]	7.50E+00	4.22E-02	-1.11E-03	0	3.91E-02	1.98E-02	3.62E-04	-2.99E+00
Photochemical ozone formation, human health	[kg NMVOC eq.]	1.90E+00	7.18E-03	1.36E-03	0	6.65E-03	6.25E-03	1.15E-04	-8.37E-01
Resource use, mineral and metals	[kg Sb eq.]	1.90E-04	9.62E-09	-1.63E-08	0	8.92E-09	7.06E-08	1.27E-09	-6.93E-05
Resource use, fossils	[MJ]	5.28E+03	9.66E+00	-6.88E-01	0	8.95E+00	1.23E+01	2.16E-01	-2.10E+03
Water use	[m³ world equiv.]	4.04E+01	2.20E-03	-4.09E-02	0	2.04E-03	8.98E-02	1.73E-03	-1.94E+01

Table 17 Resource use indicators of Door System Model 3

Resource use indicators	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
Use of renewable primary energy (PERE)	[MJ]	7.72E+02	3.15E-02	7.28E+01	0	2.92E-02	1.42E+00	2.58E-02	-3.03E+02
Primary energy resources used as raw materials (PERM)	[MJ]	6.48E+01	0	-7.34E+01	0	0	0	0	0
Total use of renewable primary energy resources (PERT)	[MJ]	8.37E+02	3.15E-02	-6.88E-01	0	2.92E-02	1.42E+00	2.58E-02	-3.03E+02
Use of non-renewable primary energy (PENRE)	[MJ]	5.15E+03	9.66E+00	1.65E+01	0	8.95E+00	4.69E+01	2.16E-01	-2.10E+03
Non-renewable primary energy resources used as raw materials (PENRM)	[kg]	1.36E+02	0	-1.72E+01	0	0	-3.46E+01	0	0
Total use of non-renewable primary energy resources (PENRT)	[MJ]	5.28E+03	9.66E+00	-6.89E-01	0	8.95E+00	1.23E+01	2.16E-01	-2.10E+03
Input of secondary material (SM)	[kg]	0	0	0	0	0	0	0	0
Use of renewable secondary fuels (RSF)	[m3]	0	0	0	0	0	0	0	0
Use of non-renewable secondary fuels (NRSF)	[MJ]	0	0	0	0	0	0	0	0
Use of net fresh water (FW)	[m^3]	1.46E+00	7.58E-05	-1.43E-03	0	7.03E-05	2.61E-03	4.95E-05	-6.75E-01

Table 18 Waste Categories and other indicators of Door system Model 3

Output flows and waste categories	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
Hazardous waste disposed (HWD)	[kg]	1.99E-06	4.46E-11	-7.94E-10	0	4.13E-11	1.25E-09	2.20E-11	-3.81E-07
Non-hazardous waste disposed (NHWD)	[kg]	8.23E+01	1.74E-04	3.60E00	0	1.61E-04	5.68E+01	1.06E00	-4.03E+01
Radioactive waste disposed (RWD)	[kg]	6.06E-02	2.10E-06	-3.73E-05	0	1.94E-06	1.08E-04	1.97E-06	-1.90E-02
Components for re-use (CRU)	[kg]	0	0	0	0	0	0	0	0
Materials for Recycling (MFR)	[kg]	0	0	0	0	0	0	0	0
Material for Energy Recovery (MER)	[kg]	0	0	0	0	0	0	0	0
Exported electrical energy (EEE)	[MJ]	0	0	0	0	0	0	0	0
Exported thermal energy (EET)	[MJ]	0	0	0	0	0	0	0	0
Other Indicators	**Unit**	0	0	0	0	0	0	0	0
Particulate matter	Disease incidences	7.78E-05	4.72E-08	-9.22E-08	0	4.37E-08	8.43E-08	1.54E-09	-4.07E-05
Ionising radiation, human health	kBq U235 eq.	7.36E+00	1.96E-04	-3.49E-03	0	1.82E-04	9.93E-03	1.80E-04	-1.73E00
Ecotoxicity, freshwater	CTUe	2.58E+03	3.79E00	3.43E00	0	3.51E00	1.95E01	3.54E-01	-3.95E+02
Human toxicity, cancer	CTUh	1.62E-06	6.54E-11	1.18E-10	0	6.06E-11	9.72E-10	1.77E-11	-2.91E-08
Human toxicity, non-cancer	CTUh	4.59E-06	3.06E-09	1.67E-08	0	2.84E-09	1.09E-07	2.03E-09	-1.67E-06
Land Use	Pt	2.05E+03	4.18E-02	-1.00E00	0	3.87E-02	1.48E00	2.71E-02	-3.97E02

4.8.4 Door System Model 4: The table below shows the LCIs, LCIAs Resource use, Waste categories for Door System Model 4 STILE 60 (Single Glazed) configuration.

Table 19 LCIA and LCI Result for Door System Model 4

Environmental impact indicators	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
Climate Change - total	[kg CO2 eq.]	4.61E+02	6.44E-01	4.32E+02	0	6.44E-01	9.71E+00	7.41E-01	-1.12E+03
Climate Change, fossil	[kg CO2 eq.]	4.65E+02	6.44E-01	-1.27E+01	0	6.44E-01	6.52E+00	1.94E-01	-1.12E+03
Climate Change, biogenic	[kg CO2 eq.]	-5.26E+00	3.51E-04	4.44E+02	0	3.51E-04	3.19E+00	5.47E-01	-1.23E-01
Climate Change, land use and land use change	[kg CO2 eq.]	6.27E-01	3.36E-05	-6.95E-02	0	3.36E-05	2.69E-03	9.68E-05	-1.69E+00
Ozone depletion	[kg CFC-11 eq.]	5.58E-11	5.30E-17	-8.51E-14	0	5.30E-17	1.67E-14	7.36E-16	-3.15E-12
Acidification	[Mole of H+ eq.]	5.07E+00	7.23E-03	-3.50E-01	0	7.23E-03	3.09E-02	1.44E-03	-1.22E+01
Eutrophication, freshwater	[kg P eq.]	4.87E-04	1.36E-07	2.84E-03	0	1.36E-07	9.59E-04	9.25E-07	-7.63E-04
Eutrophication, marine	[kg N eq.]	6.56E-01	3.40E-03	2.24E-02	0	3.40E-03	7.85E-03	3.81E-04	-1.36E+00
Eutrophication, terrestrial	[Mole of N eq.]	7.26E+00	3.73E-02	-8.04E-02	0	3.73E-02	8.58E-02	4.16E-03	-1.49E+01
Photochemical ozone formation, human health	[kg NMVOC eq.]	1.84E+00	6.35E-03	9.80E-02	0	6.35E-03	2.42E-02	1.32E-03	-4.20E+00
Resource use, mineral and metals	[kg Sb eq.]	9.31E-05	8.51E-09	-1.17E-06	0	8.51E-09	3.94E-07	1.46E-08	-1.69E-03
Resource use, fossils	[MJ]	5.11E+03	8.55E+00	-4.97E+01	0	8.55E+00	9.13E+01	2.48E+00	-1.10E+04
Water use	[m³ world equiv.]	3.88E+01	1.95E-03	-2.95E+00	0	1.95E-03	-1.16E-02	1.99E-02	-1.17E+02

Table 20 Resource use indicators of Door System Model 4

Resource use indicators	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
Use of renewable primary energy (PERE)	[MJ]	7.72E+02	3.15E-02	7.28E+01	0	2.92E-02	1.42E00	2.58E-02	-3.03E02
Primary energy resources used as raw materials (PERM)	[MJ]	6.48E+01		-7.34E+01	0	0	0	0	0
Total use of renewable primary energy resources (PERT)	[MJ]	8.37E+02	3.15E-02	-6.88E-01	0	2.92E-02	1.42E00	2.58E-02	-3.03E02
Use of non-renewable primary energy (PENRE)	[MJ]	5.15E+03	9.66E00	1.65E+01	0	8.95E00	4.69E+01	2.16E-01	-2.10E03
Non-renewable primary energy resources used as raw materials (PENRM)	[kg]	1.36E+02		-1.72E+01	0	0	-3.46E+01	0	0
Total use of non-renewable primary energy resources (PENRT)	[MJ]	5.28E+03	9.66E00	-6.89E-01	0	8.95E00	1.23E+01	2.16E-01	-2.10E03
Input of secondary material (SM)	[kg]	0	0	0	0	0	0	0	0
Use of renewable secondary fuels (RSF)	[m3]	0	0	0	0	0	0	0	0
Use of non-renewable secondary fuels (NRSF)	[MJ]	0	0	0	0	0	0	0	0
Use of net fresh water (FW)	[m^3]	1.46E+00	7.58E-05	-1.43E-03	0	7.03E-05	2.61E-03	4.95E-05	-6.75E-01

Table 21 Waste categories and other indicators of Model 4

Output flows and waste categories	**Unit**	**A1**	**A2**	**A3**	**A4**	**A5**	**C1**	**C2**	**C3**	**C4**	**D**
Hazardous waste disposed (HWD)	[kg]	1.08E-06	1.13E-10	8.81E-07	3.94E-11	-5.73E-08	0	3.94E-11	8.88E-09	2.53E-10	-1.80E-06
Non-hazardous waste disposed (NHWD)	[kg]	8.51E01	4.42E-04	-4.34E00	1.54E-04	2.60E02	0	1.54E-04	1.44E02	1.22E01	-1.91E02
Radioactive waste disposed (RWD)	[kg]	6.03E-02	5.32E-06	-1.01E-03	1.86E-06	-2.69E-03	0	1.86E-06	5.13E-04	2.26E-05	-9.81E-02
Components for re-use (CRU)	[kg]	0	0	0	0	0	0	0	0	0	0
Materials for Recycling (MFR)	[kg]	0	0	0	0	0	0	0	0	0	0
Material for Energy Recovery (MER)	[kg]	0	0	0	0	0	0	0	0	0	0
Exported electrical energy (EEE)	[MJ]	0	0	0	0	0	0	0	0	0	0
Exported thermal energy (EET)	[MJ]	0	0	0	0	0	0	0	0	0	0
Other Indicators	**Unit**	**A1**	**A2**	**A3**	**A4**	**A5**	**C1**	**C2**	**C3**	**C4**	**D**
Particulate matter	Disease incidences	7.96E-05	1.07E-07	-4.06E-06	4.17E-08	-6.65E-06	0	4.17E-08	3.61E-07	1.77E-08	-2.02E-04
Ionising radiation, human health	kBq U235 eq.	7.34E00	4.98E-04	-3.64E-02	1.74E-04	-2.52E-01	0	1.74E-04	4.73E-02	2.07E-03	-7.78E00
Ecotoxicity, freshwater	CTUe	2.44E03	9.61E00	1.74E00	3.35E00	2.47E02	0	3.35E00	9.12E01	4.07E00	-2.11E03
Human toxicity, cancer	CTUh	6.55E-07	1.65E-10	-9.31E-10	5.79E-11	8.49E-09	0	5.79E-11	4.20E-09	2.04E-10	-1.80E-07
Human toxicity, non-cancer	CTUh	4.38E-06	7.26E-09	6.81E-08	2.71E-09	1.20E-06	0	2.71E-09	3.55E-07	2.33E-08	-8.90E-06
Land Use	Pt	8.27E02	1.06E-01	1.20E03	3.69E-02	-7.23E01	0	3.69E-02	6.47E00	3.11E-01	-2.02E03

4.8.5 Door System Model 5: The table below shows the LCIs, LCIAs Resource use, Waste categories for Door System STILE 75 DG (Double Glazed) Model 5 configuration.

Table 22 LCIA and LCI Result for Door System Model 5

Environmental impact indicators	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
Climate Change - total	[kg CO2 eq.]	6.08E+02	6.80E-01	4.56E+02	0	6.80E-01	1.03E+01	7.83E-01	-1.18E+03
Climate Change, fossil	[kg CO2 eq.]	6.13E+02	6.80E-01	-1.34E+01	0	6.80E-01	6.88E+00	2.05E-01	-1.18E+03
Climate Change, biogenic	[kg CO2 eq.]	-5.21E+00	3.71E-04	4.70E+02	0	3.71E-04	3.37E+00	5.78E-01	-1.30E-01
Climate Change, land use and land use change	[kg CO2 eq.]	8.73E-01	3.55E-05	-7.35E-02	0	3.55E-05	2.84E-03	1.02E-04	-1.78E+00
Ozone depletion	[kg CFC-11 eq.]	5.62E-11	5.60E-17	-8.99E-14	0	5.60E-17	1.77E-14	7.77E-16	-3.33E-12
Acidification	[Mole of H+ eq.]	6.86E+00	7.64E-03	-3.69E-01	0	7.64E-03	3.26E-02	1.53E-03	-1.29E+01
Eutrophication, freshwater	[kg P eq.]	5.93E-04	1.44E-07	3.00E-03	0	1.44E-07	1.01E-03	9.78E-07	-8.06E-04
Eutrophication, marine	[kg N eq.]	8.49E-01	3.59E-03	2.37E-02	0	3.59E-03	8.29E-03	4.02E-04	-1.44E+00
Eutrophication, terrestrial	[Mole of N eq.]	9.36E+00	3.94E-02	-8.49E-02	0	3.94E-02	9.07E-02	4.39E-03	-1.58E+01
Photochemical ozone formation, human health	[kg NMVOC eq.]	2.44E+00	6.71E-03	1.04E-01	0	6.71E-03	2.56E-02	1.39E-03	-4.44E+00
Resource use, mineral and metals	[kg Sb eq.]	1.02E-04	8.99E-09	-1.24E-06	0	8.99E-09	4.16E-07	1.54E-08	-1.79E-03
Resource use, fossils	[MJ]	6.60E+03	9.03E+00	-5.25E+01	0	9.03E+00	9.64E+01	2.62E+00	-1.17E+04
Water use	[m³ world equiv.]	5.21E+01	2.06E-03	-3.12E+00	0	2.06E-03	-1.23E-02	2.10E-02	-1.24E+02

Table 23 Resource use indicators of Model 5

Resource use indicators	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
Use of renewable primary energy (PERE)	[MJ]	9.85E+02	2.95E-02	2.10E+01	0	2.95E-02	6.90E+00	3.13E-01	-1.63E+03
Primary energy resources used as raw materials (PERM)	[MJ]	6.48E+01	0	-7.34E+01	0	0	0	0	0
Total use of renewable primary energy resources (PERT)	[MJ]	1.05E+03	2.95E-02	-5.24E+01	0	2.95E-02	6.90E+00	3.13E-01	-1.63E+03
Use of non-renewable primary energy (PENRE)	[MJ]	6.46E+03	9.03E+00	-3.53E+01	0	9.03E+00	1.38E+02	2.62E+00	-1.17E+04
Non-renewable primary energy resources used as raw materials (PENRM)	[kg]	1.36E+02	0	-1.72E+01	0	0	-4.20E+01	0	0
Total use of non-renewable primary energy resources (PENRT)	[MJ]	6.60E+03	9.03E+00	-5.25E+01	0	9.03E+00	9.64E+01	2.62E+00	-1.17E+04
Input of secondary material (SM)	[kg]	0	0	0	0	0	0	0	0
Use of renewable secondary fuels (RSF)	[m3]	0	0	0	0	0	0	0	0
Use of non-renewable secondary fuels (NRSF)	[MJ]	0	0	0	0	0	0	0	0
Use of net fresh water (FW)	[m^3]	1.90E+00	7.08E-05	-1.09E-01	0	7.08E-05	3.50E-03	6.01E-04	-4.23E+00

Table 24 Waste categories and other indicators of Model 5

Output flows and waste categories	Unit	A1	A2	A3	A4	A5	C1	C2	C3	C4	D
Hazardous waste disposed (HWD)	[kg]	1.08E-06	1.13E-10	8.81E-07	3.94E-11	-5.73E-08	0	3.94E-11	8.88E-09	2.53E-10	-1.80E-06
Non-hazardous waste disposed (NHWD)	[kg]	8.51E01	4.42E-04	-4.34E00	1.54E-04	2.60E02	0	1.54E-04	1.44E02	1.22E01	-1.91E02
Radioactive waste disposed (RWD)	[kg]	6.03E-02	5.32E-06	-1.01E-03	1.86E-06	-2.69E-03	0	1.86E-06	5.13E-04	2.26E-05	-9.81E-02
Components for re-use (CRU)	[kg]	0	0	0	0	0	0	0	0	0	0
Materials for Recycling (MFR)	[kg]	0	0	0	0	0	0	0	0	0	0
Material for Energy Recovery (MER)	[kg]	0	0	0	0	0	0	0	0	0	0
Exported electrical energy (EEE)	[MJ]	0	0	0	0	0	0	0	0	0	0
Exported thermal energy (EET)	[MJ]	0	0	0	0	0	0	0	0	0	0
Other Indicators	**Unit**	**A1**	**A2**	**A3**	**A4**	**A5**	**C1**	**C2**	**C3**	**C4**	**D**
Particulate matter	Disease incidences	7.96E-05	1.07E-07	-4.06E-06	4.17E-08	-6.65E-06	0	4.17E-08	3.61E-07	1.77E-08	-2.02E-04
Ionising radiation, human health	kBq U235 eq.	7.34E00	4.98E-04	-3.64E-02	1.74E-04	-2.52E-01	0	1.74E-04	4.73E-02	2.07E-03	-7.78E00
Ecotoxicity, freshwater	CTUe	2.44E03	9.61E00	1.74E00	3.35E00	2.47E02	0	3.35E00	9.12E01	4.07E00	-2.11E03
Human toxicity, cancer	CTUh	6.55E-07	1.65E-10	-9.31E-10	5.79E-11	8.49E-09	0	5.79E-11	4.20E-09	2.04E-10	-1.80E-07
Human toxicity, non-cancer	CTUh	4.38E-06	7.26E-09	6.81E-08	2.71E-09	1.20E-06	0	2.71E-09	3.55E-07	2.33E-08	-8.90E-06
Land Use	Pt	8.27E02	1.06E-01	1.20E03	3.69E-02	-7.23E01	0	3.69E-02	6.47E00	3.11E-01	-2.02E03

4.8.6 Door SystemModel 6: The table below shows the LCIs, LCIAs Resource use, Waste categories for Door System STILE 75 (Single Glazed) (Model 6). configuration.

Table 23 LCIA and LCI Result for Door System Model 6

Environmental impact indicators	Unit	A1	A2	A3	A4	A5	C1	C2	C3	C4	D
Climate Change - total	[kg CO2 eq.]	6.27E+02	1.81E00	-2.63E+01	6.74E-01	4.52E+02	0	6.74E-01	1.02E+01	7.76E-01	-1.17E+03
Climate Change, fossil	[kg CO2 eq.]	6.26E+02	1.81E00	-2.06E+01	6.74E-01	-1.33E+01	0	6.74E-01	6.82E00	2.03E-01	-1.17E+03
Climate Change, biogenic	[kg CO2 eq.]	4.14E-01	-6.82E-04	-5.62E00	3.68E-04	4.65E+02	0	3.68E-04	3.34E00	5.73E-01	-1.29E-01
Climate Change, land use and land use change	[kg CO2 eq.]	9.01E-01	9.44E-05	-3.71E-02	3.52E-05	-7.28E-02	0	3.52E-05	2.81E-03	1.01E-04	-1.77E00
Ozone depletion	[kg CFC-11 eq.]	2.18E-11	1.49E-16	3.44E-11	5.54E-17	-8.91E-14	0	5.54E-17	1.75E-14	7.70E-16	-3.30E-12
Acidification	[Mole of H+ eq.]	7.08E00	2.01E-02	-3.15E-01	7.57E-03	-3.66E-01	0	7.57E-03	3.23E-02	1.51E-03	-1.28E+01
Eutrophication, freshwater	[kg P eq.]	4.67E-04	3.83E-07	1.22E-04	1.43E-07	2.97E-03	0	1.43E-07	1.00E-03	9.68E-07	-7.99E-04
Eutrophication, marine	[kg N eq.]	8.61E-01	9.40E-03	-2.82E-02	3.56E-03	2.35E-02	0	3.56E-03	8.21E-03	3.98E-04	-1.43E00
Eutrophication, terrestrial	[Mole of N eq.]	9.52E00	1.03E-01	-3.33E-01	3.91E-02	-8.41E-02	0	3.91E-02	8.98E-02	4.35E-03	-1.56E+01
Photochemical ozone formation, human health	[kg NMVOC eq.]	2.49E00	1.74E-02	-8.95E-02	6.65E-03	1.03E-01	0	6.65E-03	2.54E-02	1.38E-03	-4.40E00
Resource use, mineral and metals	[kg Sb eq.]	1.07E-04	2.39E-08	2.04E-07	8.91E-09	-1.23E-06	0	8.91E-09	4.12E-07	1.53E-08	-1.77E-03
Resource use, fossils	[MJ]	6.65E+03	2.40E+01	-1.33E+02	8.94E00	-5.20E+01	0	8.94E00	9.55E+01	2.60E00	-1.15E04
Water use	[m³ world equiv.]	5.35E+01	5.46E-03	-1.80E00	2.04E-03	-3.09E00	0	2.04E-03	-1.21E-02	2.08E-02	-1.23E+02

Table 24 Resource Use Indicators of Model 6

Resource use indicators	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
Use of renewable primary energy (PERE)	[MJ]	9.78E+02	2.92E-02	2.15E+01	0	2.92E-02	6.84E+00	3.10E-01	-1.61E+03
Primary energy resources used as raw materials (PERM)	[MJ]	6.48E+01	0	-7.34E+01	0	0	0	0	0
Total use of renewable primary energy resources (PERT)	[MJ]	1.04E+03	2.92E-02	-5.19E+01	0	2.92E-02	6.84E+00	3.10E-01	-1.61E+03
Use of non-renewable primary energy (PENRE)	[MJ]	6.40E+03	8.94E+00	-3.48E+01	0	8.94E+00	1.38E+02	2.60E+00	-1.15E+04
Non-renewable primary energy resources used as raw materials (PENRM)	[kg]	1.36E+02		-1.72E+01	0		-4.20E+01		
Total use of non-renewable primary energy resources (PENRT)	[MJ]	6.54E+03	8.94E+00	-5.20E+01	0	8.94E+00	9.55E+01	2.60E+00	-1.15E+04
Input of secondary material (SM)	[kg]	0	0	0	0	0	0	0	0
Use of renewable secondary fuels (RSF)	[m3]	0	0	0	0	0	0	0	0
Use of non-renewable secondary fuels (NRSF)	[MJ]	0	0	0	0	0	0	0	0
Use of net fresh water (FW)	[m^3]	1.89E+00	7.02E-05	-1.08E-01	0	7.02E-05	3.46E-03	5.95E-04	-4.19E+00

Table 25 Waste Categories and Other Indicators of Model 6

Output flows and waste categories	**Unit**	**A1-A3**	**A4**	**A5**	**C1**	**C2**	**C3**	**C4**	**D**
Hazardous waste disposed (HWD)	[kg]	2.23E-06	4.13E-11	-6.00E-08	0	4.13E-11	9.30E-09	2.65E-10	-1.88E-06
Non-hazardous waste disposed (NHWD)	[kg]	1.08E+02	1.61E-04	2.72E+02	0	1.61E-04	1.50E+02	1.28E+01	-2.00E+02
Radioactive waste disposed (RWD)	[kg]	7.15E-02	1.94E-06	-2.82E-03	0	1.94E-06	5.37E-04	2.36E-05	-1.03E-01
Components for re-use (CRU)	[kg]	0	0	0	0	0	0	0	0
Materials for Recycling (MFR)	[kg]	0	0	0	0	0	0	0	0
Material for Energy Recovery (MER)	[kg]	0	0	0	0	0	0	0	0
Exported electrical energy (EEE)	[MJ]	0	0	0	0	0	0	0	0
Exported thermal energy (EET)	[MJ]	0	0	0	0	0	0	0	0
Other Indicators	**Unit**	**A1-A3**	**A4**	**A5**	**C1**	**C2**	**C3**	**C4**	**D**
Particulate matter	Disease incidences	1.04E-04	4.37E-08	-6.96E-06	0	4.37E-08	3.78E-07	1.85E-08	-2.11E-04
Ionising radiation, human health	kBq U235 eq.	8.38E+00	1.82E-04	-2.64E-01	0	1.82E-04	4.95E-02	2.17E-03	-8.14E+00
Ecotoxicity, freshwater	CTUe	2.62E+03	3.51E+00	2.59E+02	0	3.51E+00	9.55E+01	4.26E+00	-2.21E+03
Human toxicity, cancer	CTUh	7.48E-07	6.06E-11	8.89E-09	0	6.06E-11	4.40E-09	2.13E-10	-1.88E-07
Human toxicity, non-cancer	CTUh	5.59E-06	2.83E-09	1.26E-06	0	2.83E-09	3.71E-07	2.44E-08	-9.31E-06
Land Use	Pt	2.31E+03	3.87E-02	-7.57E+01	0	3.87E-02	6.77E+00	3.26E-01	-2.11E+03

4.8.7 Door SystemModel 7: The table below shows the LCIs, LCIAs Resource use, Waste categories, optional indicators for STILE 100 (Single Glazed) Model 7 configuration.

Table 26 LCIA and LCI Result for Door System Model 7

Environmental impact indicators	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
Climate Change - total	[kg CO2 eq.]	5.74E+02	6.20E-01	4.15E02	0	6.20E-01	9.34E00	7.13E-01	-1.08E03
Climate Change, fossil	[kg CO2 eq.]	5.79E+02	6.19E-01	-1.22E01	0	6.19E-01	6.27E00	1.87E-01	-1.08E03
Climate Change, biogenic	[kg CO2 eq.]	-5.24E+00	3.38E-04	4.28E02	0	3.38E-04	3.07E00	5.26E-01	-1.19E-01
Climate Change, land use and land use change	[kg CO2 eq.]	8.22E-01	3.23E-05	-6.69E-02	0	3.23E-05	2.59E-03	9.31E-05	-1.62E00
Ozone depletion	[kg CFC-11 eq.]	5.76E-11	5.09E-17	-8.19E-14	0	5.09E-17	1.61E-14	7.08E-16	-3.03E-12
Acidification	[Mole of H+ eq.]	6.43E+00	6.96E-03	-3.36E-01	0	6.96E-03	2.97E-02	1.39E-03	-1.17E01
Eutrophication, freshwater	[kg P eq.]	5.65E-04	1.31E-07	2.73E-03	0	1.31E-07	9.23E-04	8.90E-07	-7.34E-04
Eutrophication, marine	[kg N eq.]	7.95E-01	3.27E-03	2.16E-02	0	3.27E-03	7.55E-03	3.66E-04	-1.31E00
Eutrophication, terrestrial	[Mole of N eq.]	8.77E+00	3.59E-02	-7.73E-02	0	3.59E-02	8.26E-02	4.00E-03	-1.44E01
Photochemical ozone formation, human health	[kg NMVOC eq.]	2.29E+00	6.11E-03	9.42E-02	0	6.11E-03	2.33E-02	1.27E-03	-4.04E00
Resource use, mineral and metals	[kg Sb eq.]	1.71E-04	8.19E-09	-1.13E-06	0	8.19E-09	3.79E-07	1.40E-08	-1.63E-03
Resource use, fossils	[MJ]	6.22E+03	8.22E00	-4.78E01	0	8.22E00	8.78E01	2.39E00	-1.06E04
Water use	[m³ world equiv.]	5.01E+01	1.87E-03	-2.84E00	0	1.87E-03	-1.12E-02	1.91E-02	-1.13E02

Table 27 Resource Use Indicators of Model 7

Resource use indicators	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
Use of renewable primary energy (PERE)	[MJ]	9.37E+02	2.68E-02	2.57E+01	0	2.68E-02	6.28E+00	2.85E-01	-1.48E+03
Primary energy resources used as raw materials (PERM)	[MJ]	6.48E+01	0	-7.34E+01	0	0	0	0	0
Total use of renewable primary energy resources (PERT)	[MJ]	1.00E+03	2.68E-02	-4.77E+01	0	2.68E-02	6.28E+00	2.85E-01	-1.48E+03
Use of non-renewable primary energy (PENRE)	[MJ]	6.08E+03	8.22E+00	-3.06E+01	0	8.22E+00	1.30E+02	2.39E+00	-1.06E+04
Non-renewable primary energy resources used as raw materials (PENRM)	[kg]	1.35E+02	0	-1.72E+01	0	0	-4.20E+01	0	0
Total use of non-renewable primary energy resources (PENRT)	[MJ]	6.22E+03	8.22E+00	-4.78E+01	0	8.22E+00	8.78E+01	2.39E+00	-1.06E+04
Input of secondary material (SM)	[kg]	0	0	0	0	0	0	0	0
Use of renewable secondary fuels (RSF)	[m3]	0	0	0	0	0	0	0	0
Use of non-renewable secondary fuels (NRSF)	[MJ]	0	0	0	0	0	0	0	0
Use of net fresh water (FW)	[m^3]	1.83E+00	6.45E-05	-9.93E-02	0	6.45E-05	3.18E-03	5.47E-04	-3.85E+00

Table 28 Waste Categories and Other Indicators of Model 7

Output flows and waste categories	Unit	A1	A2	A3	A4	A5	C1	C2	C3	C4	D
Hazardous waste disposed (HWD)	[kg]	1.28E-06	1.05E-10	8.92E-07	3.79E-11	-5.51E-08	0	3.79E-11	8.55E-09	2.44E-10	-1.73E-06
Non-hazardous waste disposed (NHWD)	[kg]	1.05E02	4.09E-04	-3.22E00	1.48E-04	2.50E02	0	1.48E-04	1.38E02	1.17E01	-1.84E02
Radioactive waste disposed (RWD)	[kg]	6.83E-02	4.93E-06	-4.81E-04	1.79E-06	-2.59E-03	0	1.79E-06	4.94E-04	2.17E-05	-9.44E-02
Components for re-use (CRU)	[kg]	0	0	0	0	0	0	0	0	0	0
Materials for Recycling (MFR)	[kg]	0	0	0	0	0	0	0	0	0	0
Material for Energy Recovery (MER)	[kg]	0	0	0	0	0	0	0	0	0	0
Exported electrical energy (EEE)	[MJ]	0	0	0	0	0	0	0	0	0	0
Exported thermal energy (EET)	[MJ]	0	0	0	0	0	0	0	0	0	0
Other Indicators	**Unit**	**A1**	**A2**	**A3**	**A4**	**A5**	**C1**	**C2**	**C3**	**C4**	**D**
Particulate matter	Disease incidences	1.02E-04	9.99E-08	-2.92E-06	4.01E-08	-6.40E-06	0	4.01E-08	3.47E-07	1.70E-08	-1.94E-04
Ionising radiation, human health	kBq U235 eq.	7.84E00	4.61E-04	1.28E-02	1.67E-04	-2.42E-01	0	1.67E-04	4.55E-02	1.99E-03	-7.48E00
Ecotoxicity, freshwater	CTUe	2.42E03	8.90E00	1.26E01	3.23E00	2.38E02	0	3.23E00	8.77E01	3.91E00	-2.03E03
Human toxicity, cancer	CTUh	7.46E-07	1.53E-10	-1.58E-10	5.57E-11	8.17E-09	0	5.57E-11	4.04E-09	1.96E-10	-1.73E-07
Human toxicity, non-cancer	CTUh	5.22E-06	6.74E-09	1.14E-07	2.60E-09	1.16E-06	0	2.60E-09	3.41E-07	2.24E-08	-8.56E-06
Land Use	Pt	1.04E03	9.80E-02	1.21E03	3.55E-02	-6.96E01	0	3.55E-02	6.22E00	2.99E-01	-1.94E03

4.9 Interpretation

The Life Cycle Assessment study conducted for Door System having 7 choices of partitioning system have been successfully able to display the environmental impacts for all the models of Door System from the cradle to grave.

Door System Model 1

Global Warming Potential (GWP): The GWP fossil is 523 kg CO_2 eq., GWP biogenic is -5.22 kg CO_2 eq. and GWP land use change is 0.726 kg CO_2 eq. with major contribution from A1-A3 (519.00 kg CO_2 eq.), A4-A5 (6.3 kg CO_2 eq.), C1-C4 (3.5 kgCO_2 eq), and D (-210 kg CO_2 eq.). Considering overall impact as 100%, A1-A3 stage (product stage) contributes the highest (~98%, majorly from raw material supply)

Ozone Depletion: The ozone depletion potential is 1.4E-10 kg CFC-11 eq. with major contribution from A1-A3 (1.4E-10 kg CFC-11 eq.), A4-A5 (-1.2E-015 kg CFC-11 eq), C1-C4 (3.3E-15 kg CFC-11 eq) and D (-6.2E-13 kg CFC-11 eq). Considering overall impacts as 99%, A1-A3 stage (product stage) contributes the highest (~99%, majorly from raw material supply).

Acidification Potential: The Acidification potential is 5.6 Mole of H^+ eq. with major contribution from A1-A3 (5.6 Mole of H^+ eq.), A4-A5 (-1.1E-03 Mole of H^+ eq), C1-C4 (9.9E-03 Mole of H^+ eq) and D (-2.5 Mole of H^+ eq). Considering overall impacts as 100%, A1-A3 stage (product stage) contributes the highest (~99%, majorly from raw material supply).

Eutrophication freshwater: The Eutrophication freshwater is 5.6E-04 kg P eq. with major contribution from A1-A3 (5.0E-04 kg P eq), A4-A5 (3.9E-05 kg P eq), C1-C4 (2.5E-05 kg P eq), and D (-1.5E-04 kg P eq) Considering overall impacts as 100%, A1-A3 stage (product stage) contributes the highest (~99%, majorly from raw material supply)

Eutrophication terrestrial: The Eutrophication terrestrial is 7.4 Mole of N eq. with major contribution from A1-A3 (7.3 Mole of N eq), A4-A5 (1.8E-02 Mole of N eq.), C1-C4 (3.6E-02 Mole of N eq.) and D (-3 Mole of N eq). Considering over all impacts as 100%, A1-A3 stage (product stage) contributes the highest (~99%, majorly from raw material supply).

Eutrophication marine: The Eutrophication marine is 6.7E-01 kg N eq. with major contribution from A1-A3 (6.6E-01 kg N eq), A4-A5 (2.1E-03 kg N eq), C2-C4 (3.3E-03 kg N eq), D (-2.8E-01 kg N eq.). Considering overall impacts as 100%, A1-A3 stage (product stage) contributes the highest (~80%, majorly from raw material supply).

Photochemical ozone formation (POCP): The POCP is 2 kg NMVOC eq. with major contribution from A1-A3 (2 kg NMVOC eq.), A4-A5 (4.6E-03 kg NMVOC eq.), C2-C4 (8.8E-03 kg NMVOC eq.) and D (-8.5E-01 kg NMVOC eq). Considering overall impacts as 100%, A1-A3 stage (product stage) contributes the highest (~99%, majorly from raw material supply).

Resource use, minerals and metals: The Resource use, minerals and metals is 2.0E-04 kg Sb eq. with major contribution from A1-A3 (2.0E-04 kg Sb eq.), A4-A5 (-1.2E-08 kg Sb eq.), C2-C4 (7.1E-08 kg Sb eq.) and D (-4.4E-05 kg Sb eq.). Considering overall impacts as 100%, A1-A3 stage (product stage) contributes the highest (~98%, majorly from raw material supply).

Resource use Fossil fuels: The Resource use – Fossil fuels is 5.4E+03 MJ with major contribution from A1-A3 (5.4E+03 MJ), A4-A5 (3.7 MJ), C1-C4 (1.6E+01 MJ) and D (-2.1E+03 MJ). Considering overall impacts as 100%, A1-A3 stage (product stage) contributes the highest (~98%, majorly from raw material supply).

Water Use: The Water use is 4.3E+01 m^3 world eq. with major contribution from A1-A3 (4.3E+01 m^3 world eq), A4-A5 (-4.0E-02 m^3 world eq), C1-C4 (8.0E-02 m^3 world eq.) and D (-1.9E+01 m^3 world eq). Considering overall impacts as 100%, A1-A3 stage (product stage) contributes the highest (~98%, majorly from raw material supply).

Limitations:

1. There were very few cases where proxy data had to be used in the LCA models. This occurred when no LCI data was available for an intermediate chemical/material.
2. Likewise, there were few cases where data had to be used from a different region or technology. These instances were uncommon and noted in the Data Quality section of the LCA Report

Concluding, the study provides fair understanding of environmental impacts during the various life cycle stages of the product. It also identifies the hotspots in the value chain where improvement activities can be prioritised and accordingly investment can be planned. The scope covers the ecological information to be divided into raw material production, transportation and manufacturing along with its packaging.

5 References

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- ISO 14020:2000 Environmental labels and declarations - General principles
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- ISO 14040:2006 Environmental management- Life cycle assessment - Principles and framework
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- PCR 2019:14, Product Category Rules (PCR) for 'CONSTRUCTION PRODUCT' Version 1.11