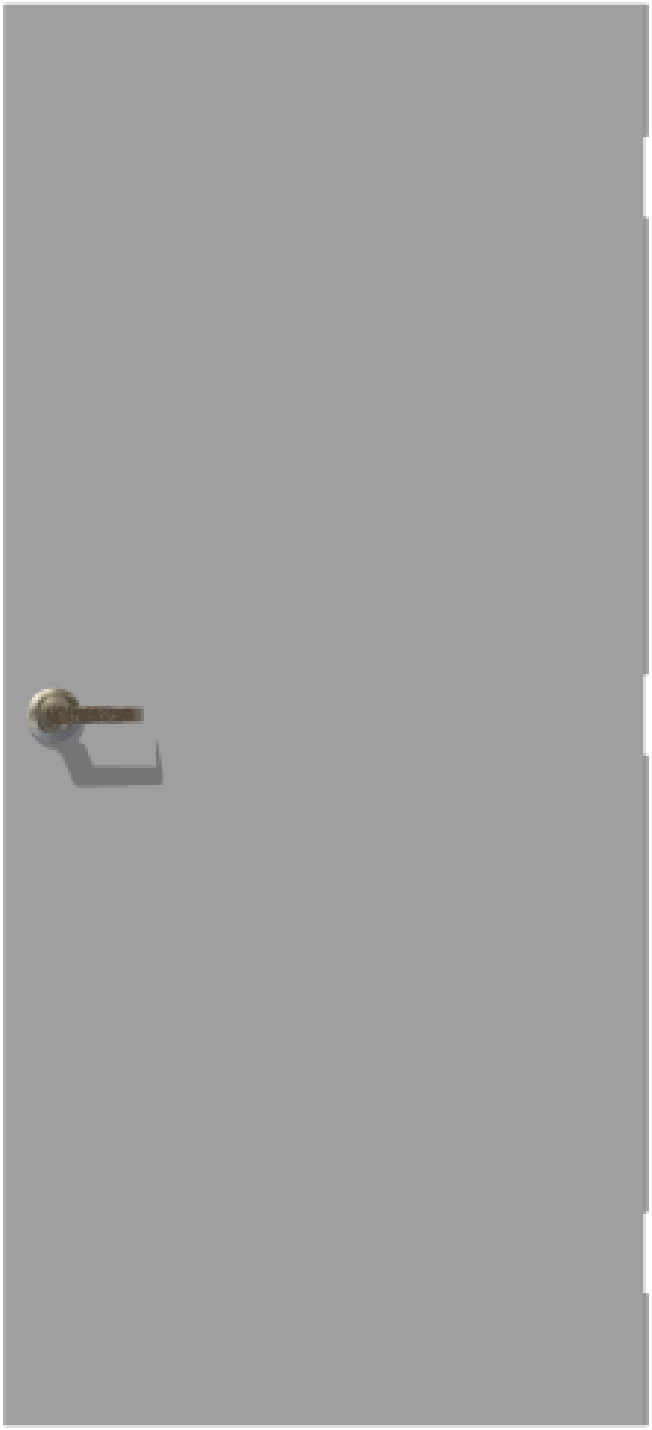
ENVIRONMENTAL PRODUCT DECLARATION

REPUBLIC DOORS

DL SERIES FLUSH PANEL HEAVY DUTY DOOR WITH POLYSTYRENE CORE



Republic Doors & Frames is part of the Allegion family of brands. Allegion is pioneering safety by protecting people where they live and work – and protecting our environment at the same time. We promote the health and safety of our employees, customers and local community members worldwide through our commitment to conducting business in a safe and environmentally responsible manner.

Additionally, Allegion recognizes the value of the Leadership in Energy and Environmental Design (LEED) rating system to building environmentally safe and sustainable structures. By using Life Cycle Assessment and Environmental Product Declarations, we aim to provide our customers with the information they need to make decisions regarding their own sustainable building concepts and green solutions.

At Allegion, we value the importance of a cleaner world and are committed to being a responsible member of our global communities.

UL CERTIFIED ENVIRONMENTAL PRODUCT DECLARATION UL.COM/EPD

ENVIRONMENTAL PRODUCT DECLARATION

ALLEGION

Republic
Doors and Frames

According to ISO 14025,
EN 15804, and ISO21930:2007

This declaration is an environmental product declaration (EPD) in accordance with ISO 14025. EPDs rely on Life Cycle Assessment (LCA) to provide information on a number of environmental impacts of products over their life cycle. Exclusions: EPDs do not indicate that any environmental or social performance benchmarks are met, and there may be impacts that they do not encompass. LCAs do not typically address the site-specific environmental impacts of raw material extraction, nor are they meant to assess human health toxicity. EPDs can complement but cannot replace tools and certifications that are designed to address these impacts and/or set performance thresholds – e.g. Type 1 certifications, health assessments and declarations, environmental impact assessments, etc. Accuracy of Results: EPDs regularly rely on estimations of impacts, and the level of accuracy in estimation of effect differs for any particular product line and reported impact. Comparability: EPDs are not comparative assertions and are either not comparable or have limited comparability when they cover different life cycle stages, are based on different product category rules or are missing relevant environmental impacts. EPDs from different programs may not be comparable.

PROGRAM OPERATOR	UL Environment
DECLARATION HOLDER	Schlage Lock Co,- Allegion
DECLARATION NUMBER	4787103471.123.1
DECLARED PRODUCT	Republic Doors and Frames- DL Series Flush Panel Heavy Duty Door-Polystyrene Core
REFERENCE PCR	Product Category Rule (PCR) for preparing an Environmental Product Declaration (EPD) for Product Group, Commercial Steel Doors and/or Steel Frames Version: March 10, 2015.
REFERENCE PCR STANDARD	☒ EN 15804 (2012) ☒ ISO 21930 (2007) ☐ ISO 21930 (2017)
DATE OF ISSUE	October 1, 2019
PERIOD OF VALIDITY	5 Years
CONTENTS OF THE DECLARATION	Product definition and information about building physics Information about basic material and the material's origin Description of the product's manufacture Indication of product processing Information about the in-use conditions Life cycle assessment results Testing results and verifications

The PCR review was conducted by:	PCR Review Panel epd@ulenvironment.com
This declaration was independently verified in accordance with ISO 14025 by Underwriters Laboratories ☐ INTERNAL ☒ EXTERNAL	Grant R. Martin Grant R. Martin, UL Environment
This life cycle assessment was independently verified in accordance with ISO 14044 and the reference PCR by:	Thomas P. Gloria Thomas P. Gloria, Industrial Ecology Consultants

1. Product Definition and Information

1.1. Description of Company/Organization

Allegion is a global pioneer in safety and security, with leading brands like aptiQ®, LCN®, Schlage®, Steelcraft® and Von Duprin®. Focusing on security around the door and adjacent areas, Allegion produces a range of solutions for homes, businesses, schools and other institutions. Allegion is a $2 billion company, with products sold in almost 130 countries.

As a subsidiary of Allegion plc, Republic Doors and Frames has a long history as one of the nation's leading manufacturers of commercial steel doors and frames.

1.2. Product Description

Product Identification

Republic Doors and Frames provide high quality hollow metal doors and frames for today's changing market. A wide range of sizes, gages, materials, designs and cores are available. This declaration represents a specific 3'x7'x1.75" thick steel door with a polystryrene core manufactured in the McKenzie, TN facility.

Product Specification

Door characteristics:

- 1-3/4" thick (Optional 1-3/8" thickness)
- Insulated polystyrene core
- 18-gage panel (Options include: 20, 16 and 14 gage)
- Fire rated up to 3 hours
- 3'x7' (Sizes range from 1'0x1'0 to 4'0x10'0 for all cores and up to 5'ox10'0 for steel stiffened core)
- Physical performance: Level A- 1 million cycles

1.3. Application

Republic steel doors and steel frames are designed to be used in commercial applications such as health care, education, hospitality, and retail. The product can also be used residentially if desired.

1.4. Declaration of Methodological Framework

This LCA is a cradle-to-building with end-of-life (option 2) study. A summary of the life cycle stages can be found in Table 9.

The cut-off criteria are described in Section 0 and allocation procedures are described in Section 2.8. No known flows are deliberately excluded from this EPD.

1.5. Technical Requirements

The following technical data describe the product undergoing the life cycle assessment.

Table 1: Door Technical Data

NAME	VALUE	UNIT	TEST METHOD
Door Thickness	1.75	inch	
Door Size	3x7	Square feet	
Face Skin Thickness	18	gage	
Frame Thickness	5.75	inch	
Frame Skin Thickness	16	gage	
SDI Classification	2		
U Value	0.41	-	ASTM C1363
R Value	2.43	-	ASTM C1363
STC	35	-	ASTM E90/E413

1.6. Properties of Declared Product as Delivered

Republic steel doors are stacked on a cardboard skid, bound by plastic bands and protected by cardboard corner cuffs. Bound products are then staged for loading onto container trucks for shipping. The dimensions of the final packaged product vary by customer order.

1.7. Material Composition

The materials that make up the flooring product are indicated in Table 2.

Table 2: Material Composition

COMPONENT	MATERIAL	MASS %
Door Panels	Cold rolled steel	94.00%
	Hot rolled steel	0.84%
	Galvanized steel	0.83%
	Primer	0.42%
	Paint Prewash	0.50%
Core	Polystyrene	2.77%
	Adhesive	0.64%

Unless indicated in the table above, the product does not contain hazardous substances per the applicable regional-specific legislation, as indicated in Section 2.8.6 of *Part A: Life Cycle Assessment Calculation Rules and Report Requirements* from UL Environment.

1.8. Manufacturing

Republic products are manufactured at McKenzie, TN facility. Manufacturing begins at receiving bays where the steel is delivered. Steel is supplied in sheet or coil form. The steel is then sheared and punched in preparation for the forming stage. In the forming stage, a pair of sheared and punched sheets are formed with a hook and seam pattern. Reinforcements are then welded onto the formed sheets. All parts are then moved through a stage wash process to remove oils and other contaminants in preparation for prime painting. Cores are then fitted into the door body and the front and back panels are bonded together. Lastly, door end channels are inserted and welded to each door panel before going through a series of paint booths, curing ovens and finally to the shipping area.

Natural resources used in the manufacturing process include electricity, natural gas and water. Steel waste is also generated throughout each step as the product is formed and assembled. All steel waste is collected and recycled offsite.

1.9. Packaging

Packaging utilized in the shipment of the product is described in Table 3.

Table 3: Packaging

Packaging Type	Material	Amount (kg)	Disposal Pathway
Skid and Corner cuffs	Cardboard	0.221	Recycled (0.165), Landfilled (0.044), Incinerated (0.011)
Banding	Plastic banding	0.036	Recycled (0.005), Landfilled (0.024), Incinerated (0.006)

1.10. Transportation

It is assumed that all raw materials are distributed by truck, based on global region. An average distance using this information was calculated and used in the model. Transport of raw material from supplier to the manufacturing facility was calculated for each raw material but only an average has been listed here due to simplicity.

An average shipping distance from the manufacturing location to the customer was utilized and was calculated from sales records. The transportation distance for all waste flows is assumed to be 161 km based on best available data.

1.11. Product Installation

Detailed installation instructions can be found online. While installation equipment is required to install the product, it is not included in the study as these are multi-use tools and the impacts per declared unit is considered negligible. All waste generated during installation, including packaging waste, is disposed of according to the tables found in Section 2.8.5 of *Part A: Life Cycle Assessment Calculation Rules and Report Requirements* from UL Environment.

1.12. Reuse, Recycling, and Energy Recovery

Republic produts may be recycled or resued at the end of life. The LCA from which this EPD is created from took the conservative approach by assuming that all products are disposed of within the system boundary.

1.13. Disposal

Disposal pathways in the EPD are modeled in accordance with disposal routes and waste classification referenced in

Sections 2.8.5 and 2.8.6 of *Part A: Life Cycle Assessment Calculation Rules and Report Requirements* from UL Environment. As this is a mixed material product, a conservative estimate is taken and all of the product is assumed to be landfilled.

2. Life Cycle Assessment Background Information

2.1. Declared Unit

The declared unit of the door product is one standard door leaf of 3' x 7', as indicated in Table 4.

Table 4: Declared Unit

NAME	VALUE	UNIT
Declared Unit	One commercial steel door of nominal dimensions of 3-feet by 7-feet considered in isolation	
Mass	41.89	kg

2.2. System Boundary

The type of EPD is cradle-to-building with end-of-life (option 2) study. All LCA modules are included and are summarized in Table 5.

Table 5: System Boundary

MODULE NAME	DESCRIPTION	ANALYSIS PERIOD	SUMMARY OF INCLUDED ELEMENTS
A1	Product Stage: Raw Material Supply	2016	Raw Material sourcing and processing as defined by secondary data.
A2	Product Stage: Transport	2016	Shipping from supplier to manufacturing site. Fuel use requirements estimated based on product weights and estimated distance.
A3	Product Stage: Manufacturing	2016	Energy, water and material inputs required for manufacturing products from raw materials. Packaging materials and manufacturing waste are included as well.
A4	Construction Process Stage: Transport	2016	Shipping from manufacturing site to project site. Fuel use requirements estimated based on product weights and mapped distance.
A5	Construction Process Stage: Installation	2016	Installation materials, installation waste and packaging material waste.
B1	Use Stage: Use	MND	Module not declared
B2	Use Stage: Maintenance	MND	Module not declared
B3	Use Stage: Repair	MND	Module not declared
B4	Use Stage: Replacement	MND	Module not declared
B5	Use Stage: Refurbishment	MND	Module not declared
B6	Operational Energy Use	MND	Module not declared
B7	Operational Water Use	MND	Module not declared
C1	EOL: Deconstruction	2019	No inputs required for deconstruction.
C2	EOL: Transport	2019	Shipping from project site to landfill. Distance assumed to be 100 miles from installation site to landfill.
C3	EOL: Waste Processing	2019	Waste processing not required. All waste can be processed as is.

Module Name	Description	Analysis Period	Summary of Included Elements
C4	EOL: Disposal	2019	Assumes all products are sent to landfill. Landfill impacts modeled based on secondary data.
D	Benefits beyond system	MND	Module not declared

2.3. Estimates and Assumptions

All estimates and assumptions are within the requirements of ISO 14040/44. The majority of the estimations are within the primary data. The primary data was collected as annual totals including all utility usage and production information. For the LCA, the usage information was divided by the production to create an energy and water use per declared unit, i.e., one door. Another assumption is that the installation tools are used enough times that the per door impacts are negligible.

2.4. Cut-off Criteria

All inputs in which data was available were included. Material inputs greater than 1% (based on total mass of the final product) were included within the scope of analysis. Material inputs less than 1% were included if sufficient data was available to warrant inclusion and/or the material input was thought to have significant environmental impact. Cumulative excluded material inputs and environmental impacts are less than 5% based on total weight of the declared unit. The list of excluded materials and energy inputs include:

- Some raw materials were excluded. This was due to lack of adequate representative secondary data within GaBi. However, the excluded materials were significantly below the cut-off criteria and include minor additives. The excluded materials include:
    - Paint pre-wash (0.50% of the door)

2.5. Data Sources

Primary data were collected by facility personnel from utility bills and was used for all manufacturing processes. Whenever available, supplier data was used for raw materials used in the production process. When primary data did not exist, secondary data for raw material production was utilized from GaBi Database Version 8.7.1.30, Service Pack 35.

2.6. Data Quality

Geographical Coverage

The geographical scope of the manufacturing portion of the life cycle is McKenzie, Tennessee. This LCA uses country specific energy datasets that take into account US eGrid specific energy and transportation mixes. Overall, the geographic coverage of primary data is considered good.

Time Coverage

Primary data were provided by Republic associates and represent calendar year 2016. Using 2016 data meets the PCR requirement that manufacturer specific data be within the last 5 years. Time coverage of this data is considered good. Data necessary to model cradle-to-gate unit processes was sourced from thinkstep LCI datasets. Time coverage of the GaBi datasets varies from approximately 2009 to present. All datasets rely on at least one 1-year average data. Overall time coverage of the datasets is considered good and meets the requirement of the PCR that all data be updated within a 10-year period. The specific time coverage of secondary datasets can be referenced in the dataset references table in

each supplemental LCA report.

Technological Coverage

Primary data provided by Republic are specific to the technology that the company uses in manufacturing their product. It is site specific and considered of good quality. It is worth noting that the energy and water used in manufacturing the product includes overhead energy such as lighting, heating and sanitary use of water. Sub-metering was not available to extract process only energy and water use from the total energy use. Sub-metering would improve the technological coverage of data quality. Data necessary to model cradle-to-gate unit processes was sourced from thinkstep LCI datasets. Technological coverage of the datasets is considered good relative to the actual supply chain of Republic. While improved life cycle data from suppliers would improve technological coverage, the use of lower quality generic datasets does meet the goal of this LCA.

2.7. Period under Review

The period under review is calendar year 2016.

2.8. Allocation

General principles of allocation were based on ISO 14040/44. Where possible, allocation was avoided. When allocation was necessary it was done on a physical mass basis. Allocation was most prevalent in the secondary GaBi datasets used to represent upstream processes. As a default, GaBi datasets use a physical mass basis for allocation.

3. Life Cycle Assessment Scenarios

Table 6: Transport to the building site (A4)

NAME	VALUE	UNIT
Fuel type	Diesel	-
Liters of fuel	39.0625	l/100km
Vehicle type	Truck	-
Transport distance	1167.2	km
Capacity utilization	0.65	-
Gross density of products transported	221.71	kg/m^3
Capacity utilization volume factor	1	-

Table 7: Installation into the building (A5)

NAME	VALUE	UNIT
Steel Hinge	0.614	kg
Product loss per declared unit	0	kg
Waste materials at the construction site before waste processing, generated by product installation	0.2587	kg
Biogenic carbon contained in packaging	0.786	kg CO_2
Direct emissions to ambient air, soil and water	0	kg
VOC content	N/A	$\mu g/m^3$

Table 8: End of life (C1-C4)

NAME		VALUE	UNIT
A conservative estimate is taken, and all of the product is assumed to be landfilled			
Collection process	Collected separately	0	kg
	Collected with mixed construction waste	41.9	kg
Recovery	Reuse	0	kg
	Recycling	0	kg
	Landfill	41.9	kg
	Incineration	0	kg
	Incineration with energy recovery	0	kg
	Energy conversion efficiency rate	0	
Disposal	Product or material for final deposition	41.9	kg

4. Life Cycle Assessment Results

Table 9: Description of the system boundary modules

	PRODUCT STAGE			CONSTRUCT-ION PROCESS STAGE		USE STAGE							END OF LIFE STAGE				BENEFITS AND LOADS BEYOND THE SYSTEM BOUNDARY
	A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
	Raw material supply	Transport	Manufacturing	Transport from gate to site	Assembly/Install	Use	Maintenance	Repair	Replacement	Refurbishment	Building Operational Energy Use During Product Use	Building Operational Water Use During Product Use	Deconstruction	Transport	Waste processing	Disposal	Reuse, Recovery, Recycling Potential
EPD Type	X			X	X	MND	MND	MND	MND	MND	MND	MND	X	X	X	X	MND

4.1. Life Cycle Impact Assessment Results

Table 10: North American Impact Assessment Results

TRACI v2.1	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
AP [kg SO_2 eq]	4.04E-01	1.81E-02	6.07E-02	MND	MND	MND	MND	MND	MND	MND	0.00E+00	1.46E-03	0.00E+00	3.99E-03	MND
EP [kg N eq]	2.63E-02	1.51E-03	3.30E-03	MND	MND	MND	MND	MND	MND	MND	0.00E+00	1.41E-04	0.00E+00	1.83E-04	MND
GWP 100 [kg CO_2 eq]	1.11E+02	3.99E+00	1.64E+01	MND	MND	MND	MND	MND	MND	MND	0.00E+00	5.40E-01	0.00E+00	6.23E-01	MND
ODP [kg CFC-11 eq]	-4.18E-09	-2.11E-14	1.28E-10	MND	MND	MND	MND	MND	MND	MND	0.00E+00	-2.89E-15	0.00E+00	-2.56E-14	MND
Resources [MJ, LHV]	6.70E+01	7.41E+00	4.58E+00	MND	MND	MND	MND	MND	MND	MND	0.00E+00	1.02E+00	0.00E+00	1.10E+00	MND
POCP [kg O_3 eq]	5.91E+00	4.22E-01	9.14E-01	MND	MND	MND	MND	MND	MND	MND	0.00E+00	3.27E-02	0.00E+00	7.56E-02	MND

Table 11: EU Impact Assessment Results

CML v4.2	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
ADPelement [kg Sb-eq]	1.95E-05	7.48E-07	9.57E-07	MND	MND	MND	MND	MND	MND	MND	0.00E+00	1.03E-07	0.00E+00	2.29E-07	MND
ADPfossil [MJ, LHV]	1.39E+03	5.54E+01	1.86E+02	MND	MND	MND	MND	MND	MND	MND	0.00E+00	7.59E+00	0.00E+00	8.73E+00	MND
AP [kg SO2 eq]	3.95E-01	1.33E-02	5.95E-02	MND	MND	MND	MND	MND	MND	MND	0.00E+00	1.10E-03	0.00E+00	3.74E-03	MND
EP [kg PO4-3 eq]	3.81E-02	3.75E-03	5.31E-03	MND	MND	MND	MND	MND	MND	MND	0.00E+00	3.18E-04	0.00E+00	4.24E-04	MND
GWP 100 [kg CO2 eq]	1.12E+02	3.99E+00	1.64E+01	MND	MND	MND	MND	MND	MND	MND	0.00E+00	5.41E-01	0.00E+00	6.26E-01	MND
ODP [kg CFC-11 eq]	-3.16E-09	3.72E-16	1.20E-10	MND	MND	MND	MND	MND	MND	MND	0.00E+00	5.10E-17	0.00E+00	3.62E-15	MND
POCP [kg ethene eq]	7.02E-02	-1.90E-03	8.26E-03	MND	MND	MND	MND	MND	MND	MND	0.00E+00	-1.65E-04	0.00E+00	2.87E-04	MND

4.2. Life Cycle Inventory Results

Table 12: Resource Use

PARAMETER	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
PERE [MJ, LHV]	5.00E+01	1.72E+00	6.35E+00	MND	MND	MND	MND	MND	MND	MND	0.00E+00	2.36E-01	0.00E+00	1.14E+00	MND
PERM [MJ, LHV]	0.00E+00	0.00E+00	0.00E+00	MND	MND	MND	MND	MND	MND	MND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	MND
PERT [MJ, LHV]	5.00E+01	1.72E+00	6.35E+00	MND	MND	MND	MND	MND	MND	MND	0.00E+00	2.36E-01	0.00E+00	1.14E+00	MND
PENRE [MJ, LHV]	1.41E+03	5.57E+01	1.90E+02	MND	MND	MND	MND	MND	MND	MND	0.00E+00	7.63E+00	0.00E+00	9.03E+00	MND
PENRM [MJ, LHV]	0.00E+00	0.00E+00	0.00E+00	MND	MND	MND	MND	MND	MND	MND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	MND
PENRT [MJ, LHV]	1.41E+03	5.57E+01	1.90E+02	MND	MND	MND	MND	MND	MND	MND	0.00E+00	7.63E+00	0.00E+00	9.03E+00	MND
SM [kg]	0.00E+00	0.00E+00	0.00E+00	MND	MND	MND	MND	MND	MND	MND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	MND
RSF [MJ, LHV]	0.00E+00	0.00E+00	0.00E+00	MND	MND	MND	MND	MND	MND	MND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	MND

PARAMETER	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
NRSF [MJ, LHV]	0.00E+00	0.00E+00	0.00E+00	MND	MND	MND	MND	MND	MND	MND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	MND
FW [m3]	4.52E-01	6.68E-03	7.31E-02	MND	MND	MND	MND	MND	MND	MND	0.00E+00	9.15E-04	0.00E+00	2.28E-03	MND

Table 13: Output Flows and Waste Categories

PARAMETER	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
HWD [kg]	1.08E-04	4.51E-07	1.84E-05	MND	MND	MND	MND	MND	MND	MND	0.00E+00	6.18E-08	0.00E+00	1.54E-07	MND
NHWD [kg]	3.05E+00	2.10E-03	2.75E-01	MND	MND	MND	MND	MND	MND	MND	0.00E+00	2.88E-04	0.00E+00	4.20E+01	MND
RWD [kg]	9.89E-03	1.23E-04	1.59E-03	MND	MND	MND	MND	MND	MND	MND	0.00E+00	1.69E-05	0.00E+00	1.21E-04	MND
CRU [kg]	0.00E+00	0.00E+00	0.00E+00	MND	MND	MND	MND	MND	MND	MND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	MND
MFR [kg]	0.00E+00	0.00E+00	1.72E-01	MND	MND	MND	MND	MND	MND	MND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	MND
MET [kg]	0.00E+00	0.00E+00	1.73E-02	MND	MND	MND	MND	MND	MND	MND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	MND
EEE [MJ, LHV]	0.00E+00	0.00E+00	1.95E-02	MND	MND	MND	MND	MND	MND	MND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	MND
EET [MJ, LHV]	0.00E+00	0.00E+00	1.95E-02	MND	MND	MND	MND	MND	MND	MND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	MND

5. LCA Interpretation

In the sourcing, extraction and manufacturing stage for the doors, cold rolled steel, hot rolled steel, and polystyrene contributes to around 70%, 0.7% and 2.5% of the overall GWP impacts respectively. Electricity and thermal energy from natural gas contributes to 0.5% and 4.9% of overall impacts respectively. Apart from manufacturing inputs, shipping to customer and fasteners at installation contribute around 3% and 12.2% respectively of total impacts.

6. Additional Environmental Information

6.1. Environment and Health During Manufacturing

Allegion and Republic meet all federal and state standards related to the Environment and Health during manufacturing. Additionally, Republic employs a strict waste minimization and recycling program that reduces and recycles waste produced in the manufacturing process.

Beyond what is regulated, there are no additional environment and health considerations during the production of goods.

7. Supporting Documentation

The full text of the acronyms found in Section 4 are found below.

Table 14: Acronym Key

Acronym	Text	Acronym	Text
LCA Indicators			
ADP-elements	Abiotic depletion potential for non-fossil resources	GWP	Global warming potential
ADP-fossil	Abiotic depletion potential for fossil resources	OPD	Depletion of stratospheric ozone layer
AP	Acidification potential of soil and water	POCP	Photochemical ozone creation potential
EP	Eutrophication potential	Resources	Depletion of non-renewable fossil fuels
LCI Indicators			
PERE	Use of renewable primary energy excluding renewable primary energy resources used as raw materials	PENRT	Total use of non-renewable primary energy resources (primary energy and primary energy resources used as raw materials)
PERM	Use of renewable primary energy resources used as raw materials	SM	Use of secondary materials
PERT	Total use of renewable primary energy resources (primary energy and primary energy resources used as raw materials)	RSF	Use of renewable secondary fuels
PENRE	Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials	NRSF	Use of non-renewable secondary fuels
PENRM	Use of non-renewable primary energy resources used as raw materials	FW	Net use of fresh water
HWD	Disposed-of-hazardous waste	MFR	Materials for recycling
NHWD	Disposed-of non-hazardous waste	MET	Materials for energy recovery
RWD	Disposed-of Radioactive waste	EEE	Exported electrical energy
CRU	Components for reuse	EET	Exported thermal energy

8. References

1. Life Cycle Assessment, Allegion, Core Allegion LCA report for Product Groups Under Commercial Steel Doors and/or Steel Frames UL 9005. WAP Sustainability Consulting. Oct. 2015.
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