

## ENVIRONMENTAL PRODUCT DECLARATION

# INTEGRATED METAL DOOR ASSEMBLY WITH LITE KIT



Total Door Systems is the global leader in fully integrated door systems that provide unparalleled security and life safety, unmatched reliability, and respect for the integrity of the architect's vision with a nearly infinite selection of design options. With all parts engineered, manufactured, and assembled from Total Door Systems' award-winning Waterford, Michigan plant, our integrated door systems arrive complete with fewer parts for streamlined installation, and savings to you in additional buildout and labor costs. Our driving philosophy is the pursuit of perfection. We have built our processes and service around integrity, efficiency, sustainability, and world-class service. Total Door Systems measures and tracks the full environmental footprint of our door systems' life cycle and analyzes them to ensure we are meeting continuous improvement goals month after month and year after year to create a more environmentally sustainable marketplace for all.



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Total Door Systems  
Integrated Metal Door Assembly with Lite Kit

According to ISO 14025,  
EN 15804, and ISO21930:2017

PROGRAM OPERATOR	UL Solutions 333 Pfingsten Road Northbrook, IL 60611 <a href="http://www.ul.com">www.ul.com</a> <a href="http://www.spot.ul.com">www.spot.ul.com</a>
GENERAL PROGRAM INSTRUCTIONS AND VERSION NUMBER	General Program Instructions v.2.5 March 2020
MANUFACTURER NAME AND ADDRESS	Total Door Systems 6145 Delfield Dr, Waterford, MI 48329
DECLARATION NUMBER	4789700730.101.2
DECLARED PRODUCT & FUNCTIONAL UNIT	One commercial steel door, nominal dimension of 3'x 7' door with lite kit
REFERENCE PCR AND VERSION NUMBER	UL PCR Part A - Version 3.2 UL Part B for Commercial Steel Doors and Frames - Version 2.0
DESCRIPTION OF PRODUCT'S INTENDED APPLICATION AND USE	Installed to facilitate entry and exit to an elevator shaft and cover an elevator shaft opening
PRODUCT RSL DESCRIPTION	25 Years
MARKETS OF APPLIABILITY	Americas
DATE OF ISSUE	April 1, 2021 (Data Update 12.19.23)
PERIOD OF VALIDITY	5 Years
EPD TYPE	Product-specific
EPD SCOPE	Cradle to gate with options
YEAR OF REPORTED MANUFACTURER PRIMARY DATA	2019
LCA SOFTWARE & VERSION NUMBER	GaBi ts Version 10.0.0.71
LCI DATABASE & VERSION NUMBER	GaBi Content Version 2020.2
LCIA METHODOLOGY & VERSION NUMBER	CML 2001-Jan 2016 and TRACI 2.1
The sub-category PCR review was conducted by:	UL Solutions PCR Review Panel epd@ul.com
This declaration was independently verified in accordance with ISO 14025:2006. The UL Environment "Part A: Calculation Rules for the Life Cycle Assessment and Requirements on the Project Report," v3.2 (Dec 2018), based on ISO 21930:2017, serves as the core PR, with additional considerations from CEN Norm EN 15804 (2013) and the USGBC/UL Environment Part A Enhancement (2017) <input type="checkbox"/> INTERNAL <input checked="" type="checkbox"/> EXTERNAL	 Grant R. Martin, UL Solutions
This life cycle assessment was conducted in accordance with ISO 14044 and the reference PCR by:	WAP Sustainability Consulting
This life cycle assessment was independently verified in accordance with ISO 14044 and the reference PCR by:	 Thomas P. Gloria, Industrial Ecology Consultants
<b>LIMITATIONS</b> Environmental declarations from different programs (ISO 14025) may not be comparable.  Comparison of the environmental performance of products using EPD information shall be based on the product's use and impacts at the building level, and therefore EPDs may not be used for comparability purposes when not considering the building energy use phase as instructed under this PCR.	

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Full conformance with this PCR allows EPD comparability only when all stages of a life cycle have been considered. However, variations and deviations are possible". Example of variations: Different LCA software and background LCI datasets may lead to differences results for upstream or downstream of the life cycle stages declared.



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## 1. Product Definition and Information

### 1.1. Description of Company

Total Door Systems is the global leader in fully integrated door systems that provide unparalleled security, unmatched reliability, and respect for the integrity of the architect’s vision with a nearly infinite selection of design options.

With all parts engineered, manufactured and assembled from Total Door Systems’ award-winning Waterford, Michigan plant, the integrated door systems arrive complete with fewer parts for streamlined installation.

### 1.2. Product Description

The integrated door assembly’s body is commercial grade steel while the hardware components can be made of various materials such as aluminum, stainless steel, brass and/or various plastics. The door’s body is custom finished prior to shipping. The product contains a flush panic exit device, an electromagnetic hold open device and standard closures, gasketing, locking mechanisms, hinges, hardware and a lite kit. This product was determined to be representative of the integrated metal door assembly products sold by Total Door Systems.

PARAMETER	VALUE	UNIT
Sound Transmission Coefficient	33	%
U-value	0.21	%
Declared product properties	Certified to BHMA – A156.32, Integrated Door Opening Assemblies, 2015	

### 1.3. Application

Total Door’s products can be used in both commercial and residential applications.

### 1.4. Declaration of Methodological Framework

This LCA is a cradle-to-gate with options study, as represented by the flow diagram below. A summary of the life cycle stages can be found in Table 4. The reference service life (RSL) is outlined in Table 7. The cut-off criteria are described in Cut-off Rules, and the allocation procedures are described in the Allocation section. No known flows are deliberately excluded from this EPD. Third party verified ISO 14040/44 secondary LCI data sets contribute more than 67% of total impacts in all impact categories required by the PCR.



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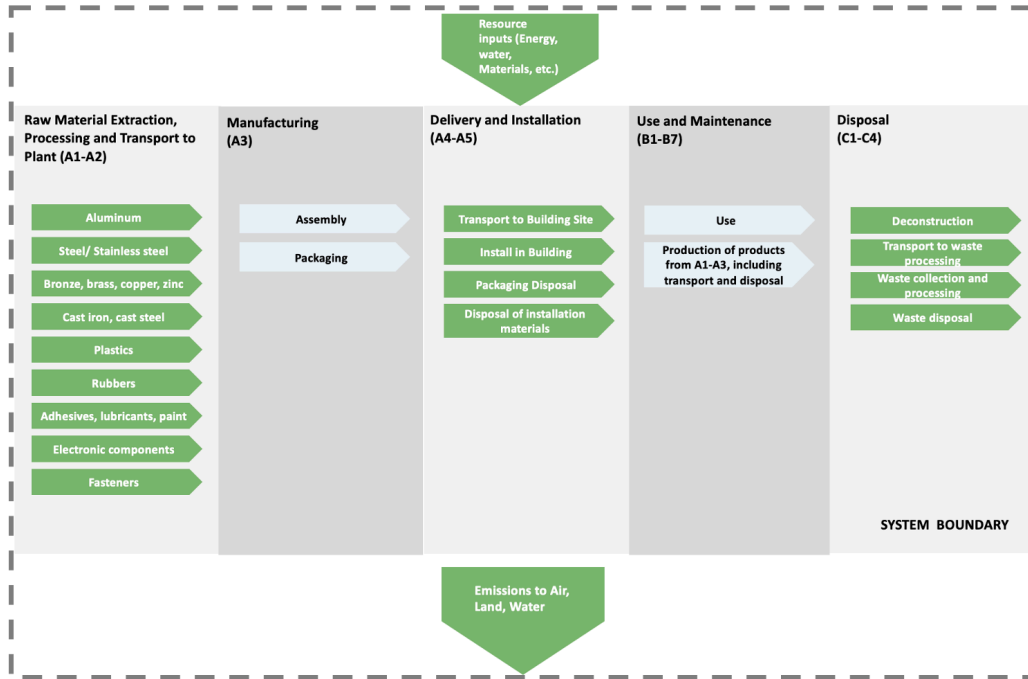


Figure 1: Flow Diagram

## 1.5. Material Composition

The materials that make up the Integrated Metal Door Assembly – Standard 3’x7’ Door with Lite Kit are indicated in Table 1.

Table 1: Material Composition

MATERIAL	INTEGRATED DOOR ASSEMBLY
Adhesive	0.57%
Aluminum	11.32%
Brass	0.01%
Electronic components	0.60%
Galvanized steel sheet	41.65%
Galvanized steel	30.50%
Glass	1.72%
Iron	1.73%
HPDE	0.01%
Nitrile butadiene rubber	0.00%



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MATERIAL	INTEGRATED DOOR ASSEMBLY
Nylon 66	0.08%
Oil	0.10%
Paint	0.32%
Polystyrene	1.44%
POM	0.01%
Polypropylene	0.00%
Polyurethane	0.00%
Styrene butadiene rubber	0.00%
Silicone	0.22%
Steel	7.12%
Stainless steel	1.00%
Steel alloy	0.06%
Varnish	0.02%
Wood	1.44%
Zinc	0.06%

## 1.6. Properties of Declared Product as Delivered

After manufacturing, Integrated Door Assemblies are laid on a pallet that is covered with a cardboard liner and foam spacer. Once the door is laid on the pallet, another cardboard liner and foam spacer is placed on the door. This process is repeated until the order is fulfilled or the stacked doors have reached 12 units high. Once stacking is completed a final layer of foam and cardboard is placed on the stack of doors. 2x4s are then laid on the stack for added protection. The entire pallet is then bound by metal banding and wrapped in plastic wrap. Product is shipped via truck.

## 1.7. Manufacturing

Manufacturing of all Total Door System products occurs at the company's facility in Waterford, MI. Manufacturing follows strict "Just in Time" principles to limit waste and inefficiencies. Manufacturing begins when raw materials are received at the facility. After receipt of the raw materials, they are moved through a CNC punch for sizing and cutting. The process continues onto the Press Break where the door body is prepared for the door skin. Once press breaking is completed, the product moves through to a CNC glue machine. At this point, all door body reinforcements are affixed (vertical and horizontal) and the core is then inserted. Finally, the top door skin is placed on the assembly. Once the door body has been assembled it is then welded to maintain all fire ratings. The door is then coated with a finish and pushed to final assembly line where hinges, latches, closers, exit devices and all other hardware materials are installed.

Natural Resources used in the manufacturing process include electricity, natural gas and water. Steel waste is also



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generated throughout each step as the product is formed and assembled. All steel waste is collected and recycled offsite.

## 1.8. Packaging

Packaging utilized in the shipment of the product is described in Table 2.

Table 2: Packaging

MATERIAL	INTEGRATED DOOR ASSEMBLY	UNIT	DISPOSAL PATHWAY
Cardboard	5.62E+00	kg	Landfilled (20%), Incinerated (5%), Recycled (75%)
PE Film	5.60E-01	kg	Landfilled (68%), Incinerated (17%), Recycled (15%)
Foam	2.25E+00	kg	Landfilled (68%), Incinerated (17%), Recycled (15%)
Pallet	2.81E+00	kg	Landfilled (20%), Incinerated (5%), Recycled (75%)

## 1.9. Transportation

It is assumed that all raw materials are distributed by truck and ship, based on global region. An average distance using this information was calculated and used in the model.

The transport distance to the end customers was calculated based on sales data for the year 2019. The transportation distance for all waste flows is assumed to be 200 km. Both distances are provided in the sub-category PCR in Section 3.12.

## 1.10. Product Installation

Detailed installation instructions are provided online at <https://totaldoor.com/installer/>. Installation equipment is required though not included in the study as these are multi-use tools and the impacts per declared unit is considered negligible. Packaging waste is generated and disposed of in this stage. Packaging and installation waste disposal have been modeled as per guidelines in section 2.8.5 of *Part A: Life Cycle Assessment Calculation Rules and Report Requirements* from UL Environment. Packaging installation waste are either landfilled, incinerated or recycled.

An installation key, which is provided with the product, is required to install the Total Door System. The sourcing and manufacturing of this key is included in A1-A3 since it is included with the product. However, the disposal of the key is included in this stage. Other installation materials, such as the hinge block and tek screws, follow this same pattern (i.e. impacts calculated in product stage. Disposal accounted for in construction process stage). All installation materials are included with the Integrated Door System.

Product should be installed by a professional and is subject to commercial building codes. Proper equipment, including protective equipment, should be used. Total Door products must be installed in full compliance with manufacturer's written instructions, which are included with each product.

## 1.11. Reuse, Recycling, and Energy Recovery

Integrated Door Assemblies may be recycled or resued at the end of life. The LCA that this EPD is created from takes the conservative approach by assuming that all products are disposed of within the system boundary.



## 1.12. 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. This indicates an end-of-life split amongst landfill, recycling, and incineration pathways. For metals disposed in the United States, 85% is recycled and 15% is landfilled. All plastics are landfilled in the United States.

## 2. Life Cycle Assessment Background Information

### 2.1. Functional Unit

The functional unit for doors is one installed commercial steel door with nominal dimensions of 3-feet x 7-feet, installed in a North American standard building with an Estimate Service Life of 75 years, as indicated in Table 3.

**Table 3: Functional Unit Details**

NAME	INTEGRATED DOOR ASSEMBLY	UNIT
Functional Unit	One installed commercial steel door with nominal dimensions of 3-feet x 7-feet over the estimated service life of a building which is 75 years	
Mass per functional unit, including fasteners	6.32E+01	kg
Reference Service Life (RSL)	25	years

The fasteners needed for installation are supplied by the manufacturer with the product and therefore are accounted for together with the product.

### 2.2. System Boundary

The type of EPD is cradle-to-grave. All LCA modules are included and are summarized in Table 4.

**Table 4: Summary of Included Life Cycle Stages**

MODULE NAME	DESCRIPTION	ANALYSIS PERIOD	SUMMARY OF INCLUDED ELEMENTS
A1	Product Stage: Raw Material Supply	2019	Raw Material sourcing and processing as defined by secondary data.
A2	Product Stage: Transport	2019	Shipping from supplier to manufacturing site. Fuel use requirements estimated based on product weights and estimated distance.
A3	Product Stage: Manufacturing	2019	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	2019	Shipping from manufacturing site to project site. Fuel use requirements estimated based on product weights and mapped distances.
A5	Construction Process Stage: Installation	2019	Installation materials, installation waste and packaging material waste.
B1	Use Stage: Use	2019	The usage of this product does not result in direct material impacts or emissions.
B2	Use Stage: Maintenance	2019	The maintenance of the products does not involve any consumption of energy or resources.
B3	Use Stage: Repair	2019	The product does not require repairing once installed.
B4	Use Stage: Replacement	2019	Total materials and energy required to manufacture the replacements needed



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MODULE NAME	DESCRIPTION	ANALYSIS PERIOD	SUMMARY OF INCLUDED ELEMENTS
			to meet the functional unit.
B5	Use Stage: Refurbishment	2019	The products do not require refurbishment once installed.
B6	Operational Energy Use	N/A	Module not declared
B7	Operational Water Use	N/A	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 200 km from installation site to landfill.
C3	EOL: Waste Processing	2019	Waste processing not required. All waste can be processed as is.
C4	EOL: Disposal	2019	The disposal process of the product varies with the material type as per Part A Section 2.8.5. The impacts from landfilling and recycling are modeled based on secondary data.
D	Benefits beyond system	N/A	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 in pieces to create an energy and water use per declared unit, i.e., one unit of product. Other assumptions are listed below:

- It is assumed that there is a 10% scrap loss rate of the input raw material while manufacturing all of Total Door's products.
- The manufacturing utility inputs are allocated on a per-unit value that was derived from the total production by units.
- The installation tools are used enough times that the per unit of product 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 functional unit.

There is no excluded material or energy input or output, except as noted below:

- Any finishes on the product (<0.1%)
- As the tools used during the installation of the product are multi-use tools and can be reused after each installation, the per-functional unit impacts are considered negligible and therefore are not included.
- Some material inputs may have been excluded within the secondary GaBi datasets used for this project. All GaBi datasets have been critically reviewed and conform to the exclusion requirements of the PCR.



## 2.5. Data Sources

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Primary data were collected by facility personnel and 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 10.0.0.71, GaBi Database Version 2020.2.

## 2.6. Data Quality

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### Geographical Coverage

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

### Time Coverage

Primary data were provided by the manufacturer and represent calendar year 2019. Using 2019 data meets the PCR requirement that manufacturer specific data be within the last 5 years. Time coverage of this data is considered excellent. Data necessary to model cradle-to-gate unit processes was sourced from thinkstep LCI datasets. Time coverage of the GaBi datasets varies from approximately 2010 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 the manufacturer is 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 Gabi LCI datasets. Technological coverage of the datasets is considered good relative to the actual supply chain of Total Door. While improved life cycle data from suppliers would improve technological coverage, the use of lower quality generic datasets does meet the goal of this EPD.

### Completeness

The data included is consider complete. The LCA model included all known material and energy flows, with the exception of what is listed in Section 2.4. As pointed out in that section, no known flows above 1% were excluded and the sum of all excluded flows totals less than 5%.

## 2.7. Period under Review

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The period under review is calendar year 2019.

## 2.8. Allocation

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General principles of allocation were based on ISO 14040/44. Where possible, allocation was avoided. To derive a per-unit value for manufacturing inputs such as electricity, thermal energy, and water, allocation based on total production

by units was adopted. Discussions with Total Door staff divulged this was a more representative way to allocate the manufacturing inputs based on the manufacturing processes used and the types of products created. There are several other products that are assembled and packaged within the same facility. It is assumed that energy used for these purposes are the same across different products. Regarding secondary datasets, as a default, GaBi datasets use a physical mass basis for allocation.

### 3. Life Cycle Assessment Scenarios<sup>1</sup>

**Table 5: Transport to the building site (A4)**

NAME	INTEGRATED DOOR ASSEMBLY	UNIT
Fuel type	Diesel	-
Liters of fuel	38.43	l/100km
Vehicle type	Truck – Trailer, basic enclosed/ 50,000 lb. payload	-
Transport distance	1.71E+03	km
Capacity utilization	65	%
Weight of products transported	6.32E+01	kg
Capacity utilization volume factor	1	-

**Table 6: Installation into the building (A5)**

NAME	INTEGRATED DOOR ASSEMBLY	UNIT
Fasteners	The fasteners for installation are accounted for in A1-A3.	
Waste material at the construction site before waste processing, generated by production installation	0.67E-01	kg
Pulp Recycling (75%)	2.87E+00	kg
Pulp Landfilling (20%)	0.76E+00	kg
Pulp Incineration (5%)	0.19E+00	kg
Total Pulp Packaging Waste	3.83E+00	kg
Plastic Recycling (75%)	0.19E+00	kg
Plastic Landfilling (20%)	0.86E+00	kg
Plastic Incineration (5%)	0.21E+00	kg
Total Plastic Packaging Waste	1.28E+00	kg
Biogenic carbon contained in packaging	12.48	kg CO <sub>2</sub>
VOC emission	N/A	µg/m <sup>3</sup>

<sup>1</sup> The tables for B1, B2, B3, B5, B6, and B7 are not included as these stages do not involve any flow input or output.

**Table 7: Reference Service Life**

NAME	INTEGRATED DOOR ASSEMBLY	
RSL	25 years	years
Design application parameters	Installation per recommendation by manufacturer	-
An assumed quality of work	Accepted industry standard	-
Indoor environment	Normal building operating conditions	-
Use conditions	Normal use conditions	-
Maintenance	None required	-

**Table 8: Replacement (B4)**

NAME	INTEGRATED DOOR ASSEMBLY	UNIT
Reference Service Life	25	Years
Replacement cycles ((ESL/RSL)-1)	2	#
Replacement of worn parts	N/A	kg
Further assumptions for scenario development	N/A	-

**Table 9: End of life (C1-C4)**

NAME		INTEGRATED DOOR ASSEMBLY	UNIT
Collection process	Collected with mixed construction waste	6.31E+01	kg
Recovery	Metal Waste Recycling (85%)	5.37E+01	kg
	Metal Waste Landfilling (15%)	9.47E+00	kg
Disposal	Product or material for final deposition	9.47E+00	kg

#### 4. Life Cycle Assessment Results

Table 9: Description of the system boundary modules

	PRODUCT STAGE			CONSTRUCTION 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
<b>Cradle to Gate with Options</b>	X			X	X	X	X	X	X	X	MND	MND	X	X	X	X	MND
X = Included stages, MND = Module not declared																	

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## 4.1. Integrated Door Assembly Results

Impact Category	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
<b>CML Impacts (Europe, Rest of World)</b>															
GWP [kg CO <sub>2</sub> eq]	3.85E+02	9.73E+00	1.52E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	MND	MND	0.00E+00	7.95E-01	0.00E+00	3.88E-01	MND
ODP [kg CFC 11 eq]	1.61E-09	1.26E-15	2.90E-16	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	MND	MND	0.00E+00	1.02E-16	0.00E+00	1.33E-15	MND
AP [kg SO <sub>2</sub> eq]	6.11E-01	1.35E-02	1.30E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	MND	MND	0.00E+00	1.75E-03	0.00E+00	1.64E-03	MND
EP [kg Phosphate eq]	6.27E-02	3.46E-03	8.42E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	MND	MND	0.00E+00	4.68E-04	0.00E+00	3.77E-04	MND
POCP [kg Ethene eq]	1.09E-01	-2.73E-03	5.02E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	MND	MND	0.00E+00	-5.76E-04	0.00E+00	2.25E-05	MND
ADPE [kg Sb eq]	1.69E-03	1.59E-06	3.46E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	MND	MND	0.00E+00	1.36E-07	0.00E+00	8.27E-08	MND
ADPF [MJ]	2.95E+03	1.26E+02	2.10E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	MND	MND	0.00E+00	1.02E+01	0.00E+00	4.83E+00	MND
<b>TRACI Impacts (North America)</b>															
AP [kg SO <sub>2</sub> eq]	6.50E-01	1.73E-02	3.07E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	MND	MND	0.00E+00	2.36E-03	0.00E+00	2.21E-03	MND
EP [kg N eq]	2.46E-02	2.51E-03	6.83E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	MND	MND	0.00E+00	2.75E-04	0.00E+00	2.64E-04	MND
GWP [kg CO <sub>2</sub> eq]	3.85E+02	9.73E+00	1.52E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	MND	MND	0.00E+00	7.95E-01	0.00E+00	3.88E-01	MND
ODP [kg CFC 11 eq]	1.65E-09	1.26E-15	2.90E-16	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	MND	MND	0.00E+00	1.02E-16	0.00E+00	1.33E-15	MND
Resources [MJ]	6.08E+02	1.85E+01	3.39E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	MND	MND	0.00E+00	1.51E+00	0.00E+00	8.04E-01	MND
POCP [kg O <sub>3</sub> eq]	1.19E+01	3.75E-01	2.06E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	MND	MND	0.00E+00	5.30E-02	0.00E+00	3.18E-02	MND
<b>Carbon Emissions and Uptake</b>															
BCRP [kg CO <sub>2</sub> ]	2.98E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	MND	MND	0.00E+00	0.00E+00	-5.37E+01	0.00E+00	MND
BCEP [kg CO <sub>2</sub> ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	MND	MND	0.00E+00	0.00E+00	9.47E+00	0.00E+00	MND
BCRK [kg CO <sub>2</sub> ]	1.25E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	MND	MND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	MND
BCEK [kg CO <sub>2</sub> ]	0.00E+00	0.00E+00	9.57E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	MND	MND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	MND
BCEW [kg CO <sub>2</sub> ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	MND	MND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	MND
CCE [kg CO <sub>2</sub> ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	MND	MND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	MND
CCR [kg CO <sub>2</sub> ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	MND	MND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	MND
CWNR [kg CO <sub>2</sub> ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	MND	MND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	MND

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According to ISO 14025,  
EN 15804 and ISO 21930:2017

Impact Category	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
<b>Resource Use Indicators</b>															
RPR <sub>e</sub> [MJ]	3.17E+02	5.56E+00	1.59E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	MND	MND	0.00E+00	4.78E-01	0.00E+00	5.13E-01	MND
RPR <sub>m</sub> [MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	MND	MND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	MND
RPR <sub>r</sub> [MJ]	3.17E+02	5.56E+00	1.59E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	MND	MND	0.00E+00	4.78E-01	0.00E+00	5.13E-01	MND
NRPR <sub>e</sub> [MJ]	5.92E+03	1.38E+02	2.68E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	MND	MND	0.00E+00	1.13E+01	0.00E+00	6.34E+00	MND
NRPR <sub>m</sub> [MJ]	4.34E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	MND	MND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	MND
NRPR <sub>r</sub> [MJ]	5.96E+03	1.38E+02	2.68E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	MND	MND	0.00E+00	1.13E+01	0.00E+00	6.34E+00	MND
SM [kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	MND	MND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	MND
RSF [MJ]	1.82E-12	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	MND	MND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	MND
NRSF [MJ]	6.12E-12	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	MND	MND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	MND
RE [MJ]	9.03E+00	2.47E-02	1.99E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	MND	MND	0.00E+00	2.13E-03	0.00E+00	9.00E-04	MND
FW [m³]	3.17E+02	5.56E+00	1.59E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	MND	MND	0.00E+00	4.78E-01	0.00E+00	5.13E-01	MND
<b>Output Flows and Waste Categories</b>															
HWD [kg]	5.71E-04	2.24E-06	2.81E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	MND	MND	0.00E+00	1.94E-07	0.00E+00	4.24E-08	MND
NHWD [kg]	1.73E+01	9.68E-03	1.54E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	MND	MND	0.00E+00	8.12E-04	0.00E+00	9.49E+00	MND
HLRW [kg]	1.44E-04	3.60E-07	2.43E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	MND	MND	0.00E+00	3.08E-08	0.00E+00	6.26E-08	MND
ILLRW [kg]	1.20E-01	2.98E-04	2.06E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	MND	MND	0.00E+00	2.55E-05	0.00E+00	5.36E-05	MND
CRU [kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	MND	MND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	MND
MR [kg]	0.00E+00	0.00E+00	3.10E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	MND	MND	0.00E+00	0.00E+00	5.37E+01	0.00E+00	MND
MER [kg]	0.00E+00	0.00E+00	4.14E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	MND	MND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	MND
EEE [MJ]	0.00E+00	0.00E+00	1.77E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	MND	MND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	MND
EET [MJ]	0.00E+00	0.00E+00	6.58E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	MND	MND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	MND

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## 5. LCA Interpretation

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Among the different life cycle stages, B4 emerges as a major contributor. This follows the fact that with an RSL of 25 years, there are 2 replacements that need to occur during the 75 years of building operation. This includes raw material extraction, manufacturing, distribution, install and end of life (for replaced product) for every replacement. This causes impacts from B4 to overshadow impacts from any other phase in the life cycle. If impacts from B4 were excluded, the largest contributor to impacts is A1-A3 (raw material extraction and manufacturing). This goes back to the energy intensive process of extracting and processing metals to make doors.

## 6. Additional Environmental Information

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### 6.1. Environment and Health During Manufacturing

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Total Door meets all federal and state standards related to the Environment and Health during manufacturing. Beyond what is regulated, there are no additional environment and health considerations during the production of goods.

### 6.2. Environment and Health During Installation

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The installation instruction that can be found on Total Door's website should be referred to and followed to have proper and safe installation.

### 6.3. Environment and Health During Use

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There are no environmental or health considerations during the use of the product.

### 6.4. Extraordinary Effects

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#### Fire

Total Door Systems' fire rated doors follow ITS/Warnock Hersey specifications and include follow-up service. Testing for fire door assemblies is in compliance with ASTM E152, UL 10C, NFPA 252, and UBC standard 7-2 (1997) parts I and II, as well as with Canadian standard CAN4-S104-M80.IBC. Doors are ADA-compliant and meet all local fire codes. They can be ordered in 1/16" increments for an exact fit to your new or existing opening. All Total Door Systems fire rated (up to three hours) doors feature smoke and draft protection.

#### Water

Should the product become flooded, the water should be removed by means of extraction and drying and the product should behave as originally intended. There are no environmental impacts associated with the product being flooded.

#### Mechanical Destruction

If the product is mechanically destroyed, it should be disposed of using standard procedures and replaced in a timely manner.





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## 7. Supporting Documentation

The full text of the acronyms found in Section 4 are found in Table 10.

**Table 10: 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
		EE	Exported energy



# ENVIRONMENTAL PRODUCT DECLARATION



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## 8. References

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3. PCR for Building-related Products and Services Part B: Commercial Steel Doors and Steel Frames EPD Requirements. UL Environment. Version 2.0. September 2020.
4. ISO 14044: 2006 Environmental Management – Life cycle assessment – Requirements and Guidelines.
5. ISO 14025:2006 Environmental labels and declarations – Type III environmental declarations – Principles and Procedures.
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7. ISO 21930:2017 Sustainability in buildings and civil engineering works – Core rules for environmental product declarations of construction products and services.
8. European Standard DIN EN 15804: 2012.04+A1 2013. Sustainability of construction works – Environmental product declarations – Core rules for the product category of construction products (includes Amendment A1:2013)
9. UL Environment General Program Instructions, March 2020, version 2.5.
10. CML-IA Characterization Factors. 5 September 2016.  
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11. TRACI: The Tool for the Reduction and Assessment of Chemical and Other Environmental Impacts. Version 2.1 – User Guide - <https://nepis.epa.gov/Adobe/PDF/P100HN53.pdf>.

