

# An Environmental Product Declaration

In accordance with ISO 14025:2006 and ISO 21930:2017

**A Cradle-to-Gate EPD (A1 to A3 Modules) for  
Steel Door Frames Manufactured by AMBICO Ltd.**




## ASTM International Certified Environmental Product Declaration

This document is a Type III environmental product declaration (EPD) covering three groups of steel frames for both steel and wood swing doors as manufactured by AMBICO at their facility in Ottawa, Ontario.

This declaration has been prepared in accordance with ISO 14025 (1), ISO 21930 (2), ISO 14040/44 (3), (4), UL Environment’s Product Category Rules for Commercial Steel Doors and Steel Door Frames (5), (6), and ASTM’s General Program Instructions for Type III EPDs (7).

The intent of this document is to further the development of environmentally compatible and more sustainable construction methods by providing comprehensive environmental information related to the potential impacts of AMBICO’s steel door frames in accordance with international standards.

## Environmental Product Declaration Summary

General Information	
<p><b>Owner of the EPD</b></p> 	<p><b>AMBICO Ltd.</b> 1120 Cummings Avenue Ottawa, ON K1J 7R8 Link (URL) <a href="https://www.ambico.com/">https://www.ambico.com/</a></p> <p>Established in 1955, Ambico has become a leading supplier in the global market for precision doors, door frames, and windows for commercial and industrial facilities, including hospitals, military installations, prison facilities, hotels, museums, and art galleries.</p> <p><i>The owner of the declaration is liable for the underlying information and evidence.</i></p>
<p><b>Manufacturing Sites</b></p>	<p>Ottawa, ON 1120 Cummings Avenue K1J 7R8</p>
<p><b>Product Group</b></p>	<p>Steel Door Frames</p>

<b>Product Definition</b>	Steel door frames manufactured for use with steel and wood doors.
<b>Product Category Rule (PCR)</b>	UL Environment, Product Category Rule for Building-Related Products and Services. Part A: Life Cycle Assessment Calculation Rules and Report Requirements, Version 4.0. March 2022 (5). Part B: Commercial Steel Doors and Steel Frames EPD Requirements (6). ISO 21930:2017 serves as the core PCR (2).
<b>Certification Period</b>	April 11 <sup>th</sup> , 2025 – 5 year validity
<b>Declared Unit</b>	One commercial three-sided steel frame that can fit a door with nominal dimensions of 3-feet by 7-feet (6).
<b>ASTM Declaration Number</b>	EPD 917
<b>EPD Information</b>	
<b>Program Operator</b>	ASTM International 100 Barr Harbor Drive, PO Box C700 West Conshohocken, PA 19428-2959, USA <a href="https://www.astm.org/products-services/certification/environmental-product-declarations/epd-pcr.html">https://www.astm.org/products-services/certification/environmental-product-declarations/epd-pcr.html</a>

#### Declaration Type

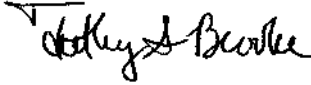

This production weighted average cradle-to-gate EPD applies to AMBICO’s steel door frames (all finishes and assembly types). The life cycle stages covered are the extraction and upstream production (A1), transportation to factory (A2), and manufacturing (A3). The declaration is intended for Business-to-Business (B-to-B) communication.

#### Applicable Countries

North America

#### Product Applicability

AMBICO’s door frames are designed and manufactured to meet a wide array of commercial applications, including but not limited to acoustic, blast & pressure resistant, bullet resistant, flood resistant, and lead lined assemblies. The steel door frame declared unit is presented as a mass-weighted average of steel door frames designed and manufactured by AMBICO for use in all assembly types.

<p>This EPD was independently verified by ASTM in accordance with ISO 14025:</p>		
<p>Internal</p>	<p><u>External</u></p>	
	<p>X</p>	<p>Tim Brooke 100 Barr Harbor Drive, PO Box C700 West Conshohocken, PA 19428-2959, USA <a href="https://www.astm.org/">https://www.astm.org/</a></p>
<p><b>EPD Project Report Information</b></p>		
<p><b>EPD Project Report</b></p>		<p>A Cradle-to-Gate Life Cycle Assessment of Steel Frames, Steel Doors, and Wood Doors Manufactured by AMBICO Ltd. (8).</p>
<p><b>Prepared by</b></p>		<p>Athena Sustainable Materials Institute 280 Albert Street, Suite 404 Ottawa, Ontario. K1P 5G8 <a href="mailto:info@athenasmi.org">info@athenasmi.org</a></p>
		
<p>The EPD project report was independently verified by and in accordance with ISO 14025 and the reference PCR:</p>		<p>Thomas P. Gloria, Ph.D. Industrial Ecology Consultants 35 Bracebridge Rd. Newton, MA 02459-1728</p>
<p><b>PCR Information</b></p>		
<p><b>Program Operator</b></p>		<p>UL Environment</p>
<p><b>Reference PCR</b></p>		<p>UL Environment, Product Category Rule for Building-Related Products and Services. Part B: Commercial Steel Doors and Steel Frames EPD Requirements (6).</p>
<p><b>Date of Issue</b></p>		<p>September 2020</p>
<p><b>PCR review was conducted by:</b></p>		<p>Lindita Bushi, Ph.D, LEED Green Associate. Athena Sustainable Materials Institute Tim Weller, AHC/CDC, FDAI. Allegion Dan Glover. ASSA ABLOY Door Group</p>
<p><b>EPD Explanatory material</b></p>		<p>Please contact the program operator for any explanatory material regarding this EPD.</p> <p>ASTM International Environmental Product Declarations 100 Barr Harbor Drive, West Conshohocken, PA 19428-2959, <a href="http://www.astm.org">http://www.astm.org</a></p>

# 1 PRODUCT IDENTIFICATION

## 1.1 PRODUCT DEFINITION

AMBICO’s steel door frames are designed to be installed in conjunction with steel door or wood door leaves. The door assemblies manufactured by AMBICO are designed and manufactured to meet a wide array of uses, including but not limited to acoustic, blast and pressure resistant, bullet resistant, flood resistant, and lead lined assemblies.

This EPD presents the results for three groups of steel door frames, with products grouped according to their mass. Table 1 below outlines the products included in each group

**Table 1: Percent Production by Mass of Steel Door Frames by Product Type**

Product Group	Included Products
Group 1	HM, RFXX, BLSPLIT, TS1, TS2, TS3, TORF, LL2B, and STC33 to STC59
Group 2	BR01 to BR08 and LL4B
Group 3	LL6B and CLBR

## 1.2 PRODUCT STANDARDS

AMBICO’s door assemblies are designed and manufactured to meet various performance standards depending on the end-use of the product, including but not limited to:

- NFPA 80-16: Standard for Fire Doors and Other Opening Protectives.
- UL 10C-16: Standard for Positive Pressure Fire Tests of Door Assemblies.
- ASTM E90-09(2016): Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements
- ASCE: Design of Blast Resistant Buildings in Petrochemical Facilities.
- UFC 3-340-02 Structures to Resist the Effects of Accidental Explosions.
- UFC 4-010-01 DoD Minimum Antiterrorism Standards for Buildings.

# 2 DECLARED UNIT

The declared unit is defined as one commercial three-sided steel frame that can fit a door with nominal dimensions of 3-feet by 7-feet (6). The physical properties and characteristics of the declared unit are presented in Table 2 below.

**Table 2: Physical Properties of Declared Unit – Steel Frame**

Material Property	Value per Declared Unit
Total Length (ft)	17
Total Mass (lbs)	Group 1: <b>85.0</b> Group 2: <b>107.4</b> Group 3: <b>142.5</b>
Mass per Unit Length (lbs/ft)	Group 1: <b>5.00</b> Group 2: <b>6.32</b> Group 3: <b>8.38</b>

Technical information such as thermal transmittance, air leakage, deflection, and sound transmittance information is not available for the average product covered in this EPD. Product specifications and drawings are available through AMBICO’s website:

<https://www.ambico.com/all-products/>

### 3 MATERIAL CONTENT

The average material composition by input material (in %) for AMBICO’s steel door frames is provided in Table 3 below.

**Table 3: Material Composition by Input Material for Steel Frames**

Material input	Material Content (in %)
	Steel Frames
Galvannealed Steel	90%
Stainless Steel	4%
Steel Tubes, Angles, and Channels	3%
Primer	1%
Galvanized Steel	<1%
Lead	<1%
Epoxy	<1%
Bronze	<1%
<b>Total weight (Input)</b>	<b>100%</b>

## 4 SYSTEM BOUNDARY

Figure 1 shows the life-cycle stages and information modules that are included within the cradle-to-gate LCA system boundary of this EPD. The boundary is “cradle-to-gate”, which consists of Extraction and Upstream Production (A1), Transportation to Factory (A2), and Manufacturing (A3).

Figure 2 provides a visual representation of the cradle-to-gate system boundary as applied to AMBICO’s manufacturing facility.

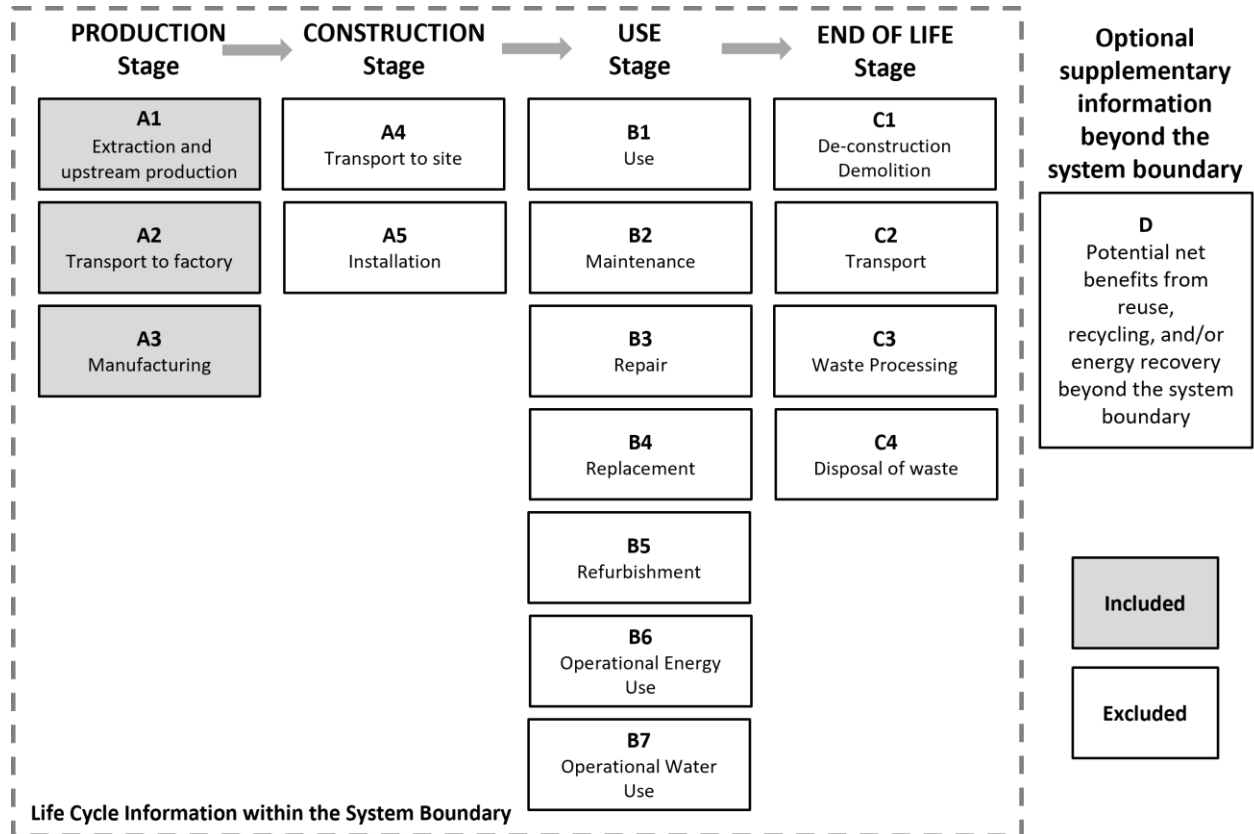


Figure 1: Life Cycle Stages and Modules

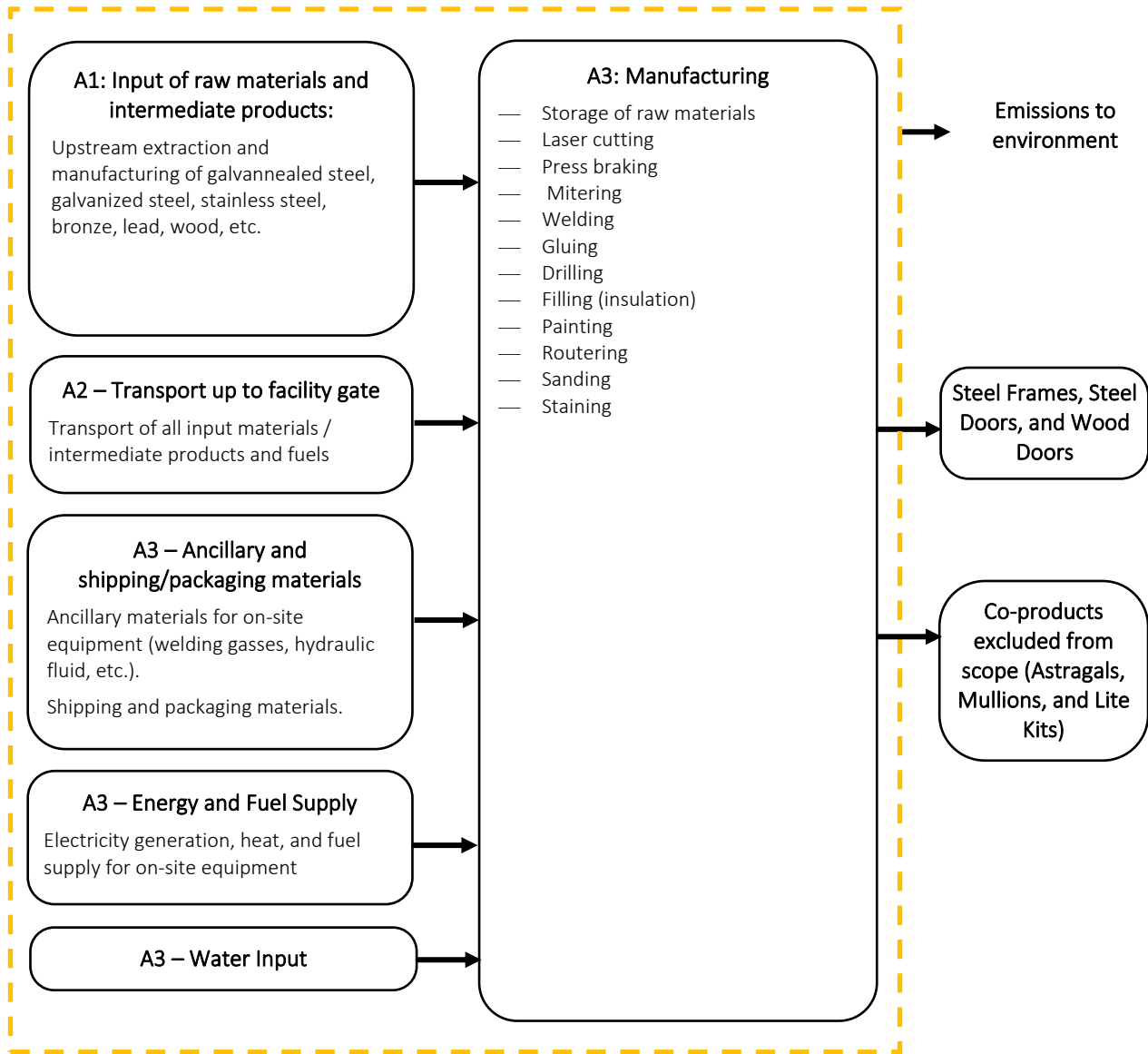


Figure 2: AMBICO Cradle-to-Gate System Boundary

## 5 LIFE CYCLE INVENTORY

### 5.1 DATA COLLECTION, SOURCES, AND CALCULATIONS

LCI data collection was based on a customized LCI survey. The LCI survey covered the primary data for AMBICO’s manufacturing facility in Ottawa, ON for the 2023 reference year (12 consecutive months). Data calculation procedures follow ISO 14044 (4), and UL Environment’s PCR for Commercial Steel Doors and Steel Frames (5), (6).

### 5.2 DATA QUALITY REQUIREMENTS AND ASSESSMENTS

The LCA project report provides a detailed description of the collected data and the data quality assessment regarding the UL Environment PCR requirements (5), (6) and ISO 14044 (5). Data quality is assessed based on its representativeness (technology coverage, geographic coverage, time coverage), completeness, consistency, reproducibility, transparency, and uncertainty (Table 4)

**Table 4: Data Quality Requirements and Assessment**

Data Quality Requirements	Description
<b>Technology Coverage</b>	<p>Data represents the prevailing technology at AMBICO’s facility in Ottawa, ON. Whenever available, North American typical or average industry LCI datasets were utilized for all upstream and core materials and processes.</p> <p><i>Technological representativeness is characterized as “high”.</i></p>
<b>Geographic Coverage</b>	<p>The geographic region considered is the U.S. and Canada.</p> <p><i>Geographical representativeness is characterized as “high”.</i></p>
<b>Time Coverage</b>	<p>Activity (primary) data are representative of the 2023 calendar year (12 months) and include the following:</p> <ul style="list-style-type: none"> <li>- Manufacturing material inputs for steel frames,</li> <li>-Inbound and outbound transportation data,</li> <li>-Production output and waste</li> </ul> <p><i>Temporal representativeness is characterized as “high”.</i></p>

<b>Completeness</b>	<p>All relevant, specific processes were considered and modelled, including inputs (raw materials, energy, and ancillary materials) and outputs (emissions, waste, and production volume).</p> <p>The relevant background materials and processes were taken from the US LCI Database (adjusted for known data placeholders), ecoinvent v 3.9.1 LCI database for US, and third-party verified EPDs where applicable. The modelling has been completed in SimaPro v.9.5, 2024 (9). The completeness of the cradle-to-gate process chain in terms of process steps is rigorously assessed for steel frames and documented in the project report.</p>
<b>Consistency</b>	<p>The LCA team conducted mass balances at the facility and product level and selected process levels to maintain high consistency.</p>
<b>Reproducibility</b>	<p>Internal reproducibility is possible since the data and the models are stored and available in the <i>Athena AMBICO LCI database</i> developed in SimaPro v.9.5, 2024 (9). A high level of transparency is provided throughout the critically reviewed LCA project report as the LCI profile is presented for each declared product and major upstream inputs. The supporting LCA project report summarizes key primary (manufacturer-specific) and secondary (generic) LCI data sources.</p>
<b>Transparency</b>	<p>Activity and LCI datasets, including data sources, are transparently disclosed in the project report.</p>
<b>Uncertainty</b>	<p>A <i>sensitivity check</i> was conducted to assess the reliability of the EPD results and conclusions by determining how they are affected by uncertainties in the data or assumptions on the calculation of LCIA and energy indicator results. The LCA background report includes the results of a <i>sensitivity analysis</i> and <i>Monte Carlo uncertainty analysis</i>.</p>

### 5.3 ALLOCATION RULES

This EPD follows the allocation guidelines of ISO 14044 (4) and the UL PCR (5), (6). AMBICO’s manufacturing facility produces various co-products, such as steel and wood door leaves, astragals, side lites, and transoms. Production output and packaging data has been provided specific to steel door frames, however allocation was required to calculate material inputs, waste, energy inputs, and ancillary materials. Mass was used as the physical parameter for allocating flows between the products of interest and other co-products to calculate the input material usage (galvannealed steel, stainless steel, etc.), energy flows (electricity, natural gas, propane, etc.), welding gasses, hydraulic fluid, greases, total water consumption, and waste flows. Allocation related to transport is based on the mass of transported inputs and outputs.

## 5.4 CUT OFF RULES

The cut-off criteria were followed as specified in the UL PCR Part A, Section 2.9 (5) and ISO 21930, 7.1.8 (2). All input/output data reported by AMBICO's manufacturing facility were included in the LCI modelling. None of the reported flow data were excluded based on the cut-off criteria. No substances with hazardous and toxic properties that concern human health and/or the environment were identified in the framework of this EPD.

This EPD excludes the following processes and activities:

- Capital goods and infrastructure, and
- Personnel-related activity (travel, furniture, office operations and supplies).

## 6 LIFE CYCLE ASSESSMENT RESULTS

Table 5 through Table 7 present the "cradle-to-gate" LCA results each grouping of steel door frames as manufactured by AMBICO. As per the UL PCR, the US EPA Tool for the Reduction and Assessment of Chemical and Other Environmental Impacts (TRACI), version 2.1, 2012 (10) impact categories are used as they provide a North American context for the mandatory category indicators to be included in this EPD. *These are relative expressions only and do not predict category impact endpoints, the exceeding of thresholds, safety margins or risks* [4], [5].

Additional mandatory resource use, waste categories and output flows are also reported as specified in ISO 21930 (2). There are several emerging LCA impact categories and inventory metrics which are still under development and can have high levels of uncertainty that preclude international acceptance. These categories are noted with an asterisk (\*) – use caution when interpreting data in these categories. As per the PCR, it is also noted that the variation in life cycle impact category results within each product group is less than 10%.

**Table 5 Production stage EPD Results (Total A1 to A3) – Steel Door Frame Group 1  
HM, RFX, BLSPLIT, TS1, TS2, TS3, TORF, LL2B, and STC33 to STC59**

Impact category and inventory indicators	Unit	A1	A2	A3	A1-A3 Total
Global warming potential, GWP 100 <sup>1)</sup>	kg CO <sub>2</sub> eq	1.18E+02	1.20E+00	5.37E+01	1.73E+02
Acidification potential, AP <sup>1)</sup>	kg SO <sub>2</sub> eq	2.96E-01	1.42E-02	2.63E-01	5.74E-01
Eutrophication potential, EP <sup>1)</sup>	kg N eq	4.68E-02	8.48E-04	1.11E-01	1.59E-01
Smog formation potential, SFP <sup>1)</sup>	kg O <sub>3</sub> eq	4.37E+00	3.62E-01	3.04E+00	7.77E+00
Ozone depletion potential, ODP <sup>1)</sup>	kg CFC-11 eq	7.07E-07	4.96E-11	7.10E-07	1.42E-06
Abiotic depletion potential for non-fossil mineral resources* <sup>2)</sup>	Kg Sb eq	2.05E-03	0	4.26E-06	2.05E-03
Fossil fuel depletion, FFD* <sup>1)</sup>	MJ surplus, LHV	6.79E+00	2.49E+00	7.14E+01	8.07E+01
Abiotic depletion potential for fossil resources, ADPf* <sup>3)</sup>	MJ, LHV	1.29E+03	1.69E+01	6.96E+02	2.01E+03
Renewable primary resources used as an energy carrier (fuel), RPR* <sup>4)</sup>	MJ, LHV	9.23E+01	0	2.54E+02	3.46E+02
Renewable primary resources with energy content used as material, RPRM* <sup>4)</sup>	MJ, LHV	0	0	7.02E+02	7.02E+02
Non-renewable primary resources used as an energy carrier (fuel), NRPR* <sup>4)</sup>	MJ, LHV	1.41E+03	1.71E+01	1.07E+03	2.49E+03
Non-renewable primary resources with energy content used as material, NRPRM* <sup>4)</sup>	MJ, LHV	0	0	2.08E+01	2.08E+01
Secondary materials, SM* <sup>4)</sup>	kg	1.94E+01	0	1.72E-02	1.94E+01
Renewable secondary fuels, RSF* <sup>4)</sup>	MJ, LHV	0	0	1.65E+01	1.65E+01
Non-renewable secondary fuels, NRSF* <sup>4)</sup>	MJ, LHV	3.00E-02	0	0	3.00E-02
Recovered energy, RE* <sup>4)</sup>	MJ, LHV	0	0	0	0
Consumption of freshwater, FW* <sup>4)</sup>	m <sup>3</sup>	3.03E-01	0	5.78E-01	8.81E-01
Hazardous waste disposed, HWD* <sup>4)</sup>	kg	2.28E-01	0	1.85E-03	2.30E-01
Non-hazardous waste disposed, NHWD* <sup>4)</sup>	kg	4.64E+00	0	1.65E+00	6.29E+00
High-level radioactive waste, conditioned, to final repository, HLRW* <sup>4) 5)</sup>	m <sup>3</sup>	2.53E-08	0	1.37E-06	1.39E-06
Intermediate- and low-level radioactive waste, conditioned, to final repository, ILLRW* <sup>4) 5)</sup>	m <sup>3</sup>	1.57E-05	0	1.07E-04	1.23E-04
Components for re-use, CRU* <sup>4)</sup>	kg	0	0	0	0
Materials for recycling, MR* <sup>4)</sup>	kg	9.01E-01	0	1.14E+01	1.23E+01
Materials for energy recovery, MER* <sup>4)</sup>	kg	0	0	0	0
Recovered energy exported from the product system, EE* <sup>4)</sup>	MJ, LHV	0	0	0	0
Removals and emissions associated with carbon content of bio-based packaging <sup>4)</sup>	kg CO <sub>2</sub>	0	0	-5.56E+01	-5.56E+01

**Table 6 Production stage EPD Results (Total A1 to A3) – Steel Door Frame Group 2  
BR01 to BR08, and LL4B**

Impact category and inventory indicators	Unit	A1	A2	A3	A1-A3 Total
Global warming potential, GWP 100 <sup>1)</sup>	kg CO <sub>2</sub> eq	1.49E+02	1.51E+00	5.37E+01	2.04E+02
Acidification potential, AP <sup>1)</sup>	kg SO <sub>2</sub> eq	3.75E-01	1.79E-02	2.63E-01	6.56E-01
Eutrophication potential, EP <sup>1)</sup>	kg N eq	5.92E-02	1.07E-03	1.11E-01	1.71E-01
Smog formation potential, SFP <sup>1)</sup>	kg O <sub>3</sub> eq	5.52E+00	4.58E-01	3.04E+00	9.02E+00
Ozone depletion potential, ODP <sup>1)</sup>	kg CFC-11 eq	8.94E-07	6.27E-11	7.10E-07	1.60E-06
Abiotic depletion potential for non-fossil mineral resources* <sup>2)</sup>	Kg Sb eq	2.59E-03	0	4.26E-06	2.59E-03
Fossil fuel depletion, FFD* <sup>1)</sup>	MJ surplus, LHV	8.58E+00	3.15E+00	7.14E+01	8.31E+01
Abiotic depletion potential for fossil resources, ADPf* <sup>3)</sup>	MJ, LHV	1.64E+03	2.13E+01	6.96E+02	2.35E+03
Renewable primary resources used as an energy carrier (fuel), RPR <sup>e</sup> * <sup>4)</sup>	MJ, LHV	1.17E+02	0	2.54E+02	3.70E+02
Renewable primary resources with energy content used as material, RPR <sup>m</sup> * <sup>4)</sup>	MJ, LHV	0	0	7.02E+02	7.02E+02
Non-renewable primary resources used as an energy carrier (fuel), NRPR <sup>e</sup> * <sup>4)</sup>	MJ, LHV	1.78E+03	2.16E+01	1.07E+03	2.87E+03
Non-renewable primary resources with energy content used as material, NRPR <sup>m</sup> * <sup>4)</sup>	MJ, LHV	0	0	2.08E+01	2.08E+01
Secondary materials, SM* <sup>4)</sup>	kg	2.45E+01	0	1.72E-02	2.45E+01
Renewable secondary fuels, RSF* <sup>4)</sup>	MJ, LHV	0	0	1.65E+01	1.65E+01
Non-renewable secondary fuels, NRSF* <sup>4)</sup>	MJ, LHV	3.80E-02	0	0	3.80E-02
Recovered energy, RE* <sup>4)</sup>	MJ, LHV	0	0	0	0
Consumption of freshwater, FW* <sup>4)</sup>	m <sup>3</sup>	3.83E-01	0	5.78E-01	9.61E-01
Hazardous waste disposed, HWD* <sup>4)</sup>	kg	2.88E-01	0	1.85E-03	2.90E-01
Non-hazardous waste disposed, NHWD* <sup>4)</sup>	kg	5.87E+00	0	1.65E+00	7.52E+00
High-level radioactive waste, conditioned, to final repository, HLRW* <sup>4)</sup> <sup>5)</sup>	m <sup>3</sup>	3.19E-08	0	1.37E-06	1.40E-06
Intermediate- and low-level radioactive waste, conditioned, to final repository, ILLRW* <sup>4)</sup> <sup>5)</sup>	m <sup>3</sup>	1.98E-05	0	1.07E-04	1.27E-04
Components for re-use, CRU* <sup>4)</sup>	kg	0	0	0	0
Materials for recycling, MR* <sup>4)</sup>	kg	1.14E+00	0	1.14E+01	1.25E+01
Materials for energy recovery, MER* <sup>4)</sup>	kg	0	0	0	0
Recovered energy exported from the product system, EE* <sup>4)</sup>	MJ, LHV	0	0	0	0
Removals and emissions associated with carbon content of bio-based packaging <sup>4)</sup>	kg CO <sub>2</sub>	0	0	-5.56E+01	-5.56E+01

**Table 7 Production stage EPD Results (Total A1 to A3) – Steel Door Frame Group 3  
LL6B and CLBR**

Impact category and inventory indicators	Unit	A1	A2	A3	A1-A3 Total
Global warming potential, GWP 100 <sup>1)</sup>	kg CO <sub>2</sub> eq	1.98E+02	2.00E+00	5.37E+01	2.53E+02
Acidification potential, AP <sup>1)</sup>	kg SO <sub>2</sub> eq	4.96E-01	2.37E-02	2.63E-01	7.84E-01
Eutrophication potential, EP <sup>1)</sup>	kg N eq	7.84E-02	1.42E-03	1.11E-01	1.91E-01
Smog formation potential, SFP <sup>1)</sup>	kg O <sub>3</sub> eq	7.32E+00	6.07E-01	3.04E+00	1.10E+01
Ozone depletion potential, ODP <sup>1)</sup>	kg CFC-11 eq	1.18E-06	8.32E-11	7.10E-07	1.90E-06
Abiotic depletion potential for non-fossil mineral resources* <sup>2)</sup>	Kg Sb eq	3.43E-03	0	4.26E-06	3.43E-03
Fossil fuel depletion, FFD* <sup>1)</sup>	MJ surplus, LHV	1.14E+01	4.18E+00	7.14E+01	8.70E+01
Abiotic depletion potential for fossil resources, ADPf* <sup>3)</sup>	MJ, LHV	2.17E+03	2.83E+01	6.96E+02	2.89E+03
Renewable primary resources used as an energy carrier (fuel), RPR <sub>E</sub> * <sup>4)</sup>	MJ, LHV	1.55E+02	0	2.54E+02	4.08E+02
Renewable primary resources with energy content used as material, RPR <sub>M</sub> * <sup>4)</sup>	MJ, LHV	0	0	7.02E+02	7.02E+02
Non-renewable primary resources used as an energy carrier (fuel), NRPR <sub>E</sub> * <sup>4)</sup>	MJ, LHV	2.36E+03	2.86E+01	1.07E+03	3.46E+03
Non-renewable primary resources with energy content used as material, NRPR <sub>M</sub> * <sup>4)</sup>	MJ, LHV	0	0	2.08E+01	2.08E+01
Secondary materials, SM* <sup>4)</sup>	kg	3.25E+01	0	1.72E-02	3.25E+01
Renewable secondary fuels, RSF* <sup>4)</sup>	MJ, LHV	0	0	1.65E+01	1.65E+01
Non-renewable secondary fuels, NRSF* <sup>4)</sup>	MJ, LHV	5.03E-02	0	0	5.03E-02
Recovered energy, RE* <sup>4)</sup>	MJ, LHV	0	0	0	0
Consumption of freshwater, FW* <sup>4)</sup>	m <sup>3</sup>	5.08E-01	0	5.78E-01	1.09E+00
Hazardous waste disposed, HWD* <sup>4)</sup>	kg	3.82E-01	0	1.85E-03	3.84E-01
Non-hazardous waste disposed, NHWD* <sup>4)</sup>	kg	7.78E+00	0	1.65E+00	9.42E+00
High-level radioactive waste, conditioned, to final repository, HLRW* <sup>4) 5)</sup>	m <sup>3</sup>	4.23E-08	0	1.37E-06	1.41E-06
Intermediate- and low-level radioactive waste, conditioned, to final repository, ILLRW* <sup>4) 5)</sup>	m <sup>3</sup>	2.62E-05	0	1.07E-04	1.33E-04
Components for re-use, CRU* <sup>4)</sup>	kg	0	0	0	0
Materials for recycling, MR* <sup>4)</sup>	kg	1.51E+00	0	1.14E+01	1.29E+01
Materials for energy recovery, MER* <sup>4)</sup>	kg	0	0	0	0
Recovered energy exported from the product system, EE* <sup>4)</sup>	MJ, LHV	0	0	0	0
Removals and emissions associated with carbon content of bio-based packaging <sup>4)</sup>	kg CO <sub>2</sub>	0	0	-5.56E+01	-5.56E+01

*Notes:*

<sup>1)</sup> Calculated as per U.S. EPA TRACI 2.1, v1.05, SimaPro v.9.5.0.2 GWP-100 (9), excludes biogenic CO<sub>2</sub> removals and emissions associated with biobased products, including bio-based packaging. Biogenic carbon content of packaging materials is reported separately. CO<sub>2</sub> emissions from calcination and carbonation do not apply to the declared products; 100-year time horizon GWP factors are provided by the IPCC 2013 Fifth Assessment Report (AR5), TRACI 2.1, v1.05 (10). FFD is required in LEED V4.1 MR Credit: Building Product Disclosure and Optimization – Environmental Product Declarations (11).

<sup>2)</sup> Calculated as per CML-IA Baseline v3.05, SimaPro v.9.5.0.2 (9).

<sup>3)</sup> Calculated as per CML-IA baseline, V4.7, SimaPro v.9.5.0.2. ADP<sub>F</sub> is also required in LEED v4.0/v4.1 MR2 Credit: Building Product Disclosure and Optimization – Environmental Product Declarations (12), (11).

<sup>4)</sup> Calculated as per ACLCA ISO 21930 Guidance (13).

<sup>5)</sup> It should be noted that the foreground system (A3 manufacturing process) does not generate any high level radioactive waste or low/intermediate level radioactive waste. Radioactive waste is primarily generated from electricity production. High level radioactive waste consists mainly of spent fuel from reactors. Low/intermediate level radioactive waste is primarily generated from routine facility maintenance and operation (2).

## 7 INTERPRETATION

AMBICO's EPD results for steel door frames represent a "cradle-to-gate" environmental profile for one commercial three-sided steel frame that can fit a door with nominal dimensions of 3-feet by 7-feet. As outlined in the UL PCR, a scaling factor of 0.0588 can be used to translate results per declared unit to linear foot (6).

*A1 – Material Extraction and Upstream Production* is the primary contributor to the environmental impact of AMBICO's steel door frames, contributing 25% to 66% of the overall potential environmental impact, depending on the impact category. The A1 impacts are primarily dominated by the galvanized steel material input.

*A3 – Manufacturing* also contributes significantly to the potential environmental impact, accounting for 33% to 75% of the overall environmental impact, depending on the impact category. The A3 impacts are primarily dominated by natural gas used for heating the manufacturing facility and the use of welding gasses during manufacturing.

*A2 – Transportation* typically does not significantly contribute to the potential environmental impact of AMBICO's steel door frames.

## 8 DECLARATION TYPE

This cradle-to-gate EPD applies to steel door frames manufactured at AMBICO's facility in Ottawa, Ontario. Production activities covered include the *Extraction and Upstream Production (A1)*, *Transport to Factory (A2)*, and *Manufacturing (A3)* modules. This declaration is intended for Business-to-Business (B-to-B) communications.

This EPD covering AMBICO's steel door frames falls under the description:

- *An average product EPD, from a single manufacturing facility.*

## 9 EPD COMPARABILITY LIMITATION STATEMENT

As specified in the UL PCR Part A (5), the following points apply to the comparability of Environmental Declarations:

- Environmental declarations from different programs may not be comparable.
- Comparison of the environmental performance of construction works and construction products using EPD information shall be based on the product's use and impacts at the construction works level. In General, EPDs may not be used for comparability purposes when not considered in a construction works context. Given this PCR ensures products meet the same functional requirements, comparability is permissible provided the information given for such comparison is transparent and the limitations of comparability explained (5).
- When comparing EPDs created using this PCR, variations and deviations are possible. Example of potential variations include different LCA software and background LCI datasets which may lead to different results for upstream or downstream of the life cycle stages declared (5).

## 10 REFERENCES

1. ISO 14025: 2006 Environmental labeling and declarations - Type III environmental declarations - Principles and procedures.
2. ISO 21930:2017 Sustainability in buildings and civil engineering works - Core rules for environmental product declarations of construction products and services.
3. ISO 14040/Amd1:2020 Environmental Management – Life Cycle Assessment – Principles and Framework, International Organization for Standardization.
4. ISO 14044/Amd1:2017/Amd2:2020 Environmental Management – Life Cycle Assessment – Requirements and guidelines, International Organization for Standardization.
5. UL Environment. Product Category Rules for Building-Related Products and Services. Part A: Life Cycle Assessment Calculation Rules and Report Requirements. Version 4.0. March 2022.
6. UL Environment. Product Category Rules (PCR) for Building-Related Products and Services. Part B: Commercial Steel Doors and Steel Frames EPD Requirements. Version 2.0. September 2020.
7. ASTM Program Operator for Product Category Rules (PCRs) and Environmental Product Declarations (EPDs), General Program Instructions, April 2020.
8. Athena Sustainable Materials Institute, A Cradle-to-Gate Life Cycle Assessment of Steel Frames, Steel Doors, and Wood Doors Manufactured by Ambico Ltd., November 2024.
9. PRé 2021. SimaPro LCA Software v 9.5, 2024, <https://simapro.com/>.
10. Bare, J., TRACI 2.0: The Tool for the Reduction and Assessment of Chemical and Other Environmental Impacts 2.0. Clean Technologies and Environmental Policy 2011, 13, (5), <https://link.springer.com/article/10.1007/s10098-010-0338-9#page-1>.
11. LEED v4.1, MRc2: Building product disclosure and optimization, Environmental Product Declarations, <https://leeduser.buildinggreen.com/credit/NC-v4.1/MRc2#tab-credit-language>.
12. LEED v4, MRc2: Building product disclosure and optimization, Environmental Product Declarations, <https://leeduser.buildinggreen.com/credit/NC-v4/MRc2#tab-credit-language>.
13. ACLCA 2019, Guidance to Calculating Non-LCIA Inventory Metrics in Accordance with ISO 21930:2017. The American Centre for Life Cycle Assessment. May, 2019.