An Environmental Product Declaration

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

A Cradle-to-Gate EPD (A1 to A3 Modules) for Wood Doors Manufactured by AMBICO Ltd.

ASTM International Certified Environmental Product Declaration

This document is a Type III environmental product declaration (EPD) covering five groups of wood 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), NSF's Product Category Rules for Interior Architectural Wood Door Leaves (5) and ASTM's General Program Instructions for Type III EPDs (6).

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 wood doors in accordance with international standards.

Environmental Product Declaration Summary

General Information	
Owner of the EPD	**AMBICO Ltd.** 1120 Cummings Avenue Ottawa, ON K1J 7R8 Link (URL) https://www.ambico.com/ 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. *The owner of the declaration is liable for the underlying information and evidence.*
Manufacturing Sites	Ottawa, ON 1120 Cummings Avenue K1J 7R8
Product Group	Wood Doors

Product Definition	Wood doors designed and manufactured for a wide array of uses, including acoustic, blast and pressure resistant, bullet resistant, flood resistant, and lead lined assemblies.
Product Category Rule (PCR)	NSF Product Category Rule for Environmental Product Declarations. PCR for Interior Architectural Wood Door Leaves, Version 6 (5) ISO 21930:2017 serves as the core PCR (2).
Certification Period	April 11th, 2025 – 5 year validity
Declared Unit	One single door leaf unit measuring 1.95 m^2 (21 ft^2) at a nominal 44.45 mm (1 ¾ in) thickness (5).
ASTM Declaration Number	EPD 916
EPD Information	
Program Operator	ASTM International 100 Barr Harbor Drive, PO Box C700 West Conshohocken, PA 19428-2959, USA https://www.astm.org/products-services/certification/environmental-product-declarations/epd-pcr.html

Declaration Type

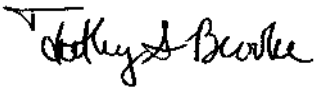
This production weighted average cradle-to-gate EPD applies to AMBICO's wood doors (all finishes and assembly types). The life cycle stages covered are the extraction and upstream production (A1), transportation to factory (A2), and manufacturing (A3). The declaration is intended for Business-to-Business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

Applicable Countries

North America

Product Applicability

AMBICO's doors 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 wood door declared unit is presented as a mass-weighted average of wood doors designed and manufactured by AMBICO for use in all assembly types.

This EPD was independently verified by ASTM in accordance with ISO 14025: **Internal** / **External** X	 Tim Brooke 100 Barr Harbor Drive, PO Box C700 West Conshohocken, PA 19428-2959, USA https://www.astm.org/
EPD Project Report Information	
EPD Project Report	A Cradle-to-Gate Life Cycle Assessment of Steel Frames, Steel Doors, and Wood Doors Manufactured by AMBICO Ltd. (7).
Prepared by	Athena Sustainable Materials Institute 280 Albert Street, Suite 404 Ottawa, Ontario. K1P 5G8 info@athenasmi.org
This EPD project report was independently verified by and in accordance with ISO 14025 and the reference PCR:	Thomas P. Gloria, Ph.D. Industrial Ecology Consultants 35 Bracebridge Rd. Newton, MA 02459-1728
PCR Information	
Program Operator	NSF International
Reference PCR	NSF Product Category Rule for Environmental Product Declarations. PCR for Interior Architectural Wood Door Leaves, Version 6 (5)
Date of Issue	December 2022
PCR review was conducted by:	Dr. Thomas P. Gloria, PhD. Industrial Ecology Consultants Dr. Michael Overcash. Environmental Clarity Mr. Bill Stough
EPD Explanatory material	Please contact the program operator for any explanatory material regarding this EPD. ASTM International Environmental Product Declarations 100 Barr Harbor Drive, West Conshohocken, PA 19428-2959, http://www.astm.org

1 PRODUCT IDENTIFICATION

1.1 PRODUCT DEFINITION

AMBICO's wood doors are designed to be installed in conjunction with steel door frames. 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 five groups of wood doors, with products grouped according to their mass. Table 1 below outlines the products included in each group.

Table 1: Percent Production by Mass of Wood Doors by Product Type

Product Group	Included Products
Group 1	HM, RFXX, and STC33 to STC40
Group 2	LL2B, TORWD, BR01 to BR03, and STC41 to STC46
Group 3	LL4B, and STC47 to STC52
Group 4	LL6B, BR04, BR06, and STC53
Group 5	BR05, BR07, BR08, and STC54 to STC56

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 a single door leaf unit measuring 1.95m^2 (21 ft^2) at a nominal 44.45 mm (1 ¾ in) thickness (5). The physical properties and characteristics of the declared unit are presented in Table 2 below.

Table 2: Physical Properties of Declared Unit – Wood Door

Material Property	Value per Declared Unit
Total Area (ft^2)	21
Thickness (in)	1 ¾
Total Mass (lbs)	Group 1: **121.4** Group 2: **185.0** Group 3: **246.5** Group 4: **320.9** Group 5: **425.9**
Mass per Unit Area (lbs/ft^2)	Group 1: **5.78** Group 2: **8.81** Group 3: **11.74** Group 4: **15.28** Group 5: **20.28**

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 wood doors is provided in Table 3 below.

Table 3: Material Composition by Input Material for Wood Doors

Material input	Material Content (in %)
Galvannealed steel	75%
Lead	11%
Wood veneer	5%
Wood stiles and rails	3%
Steel tubes, angles, and channels	2%
Fiberglass insulation	2%
Plastic laminate	1%
Epoxy	<1%
Primer	<1%
Total weight (Input)	**100%**

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.

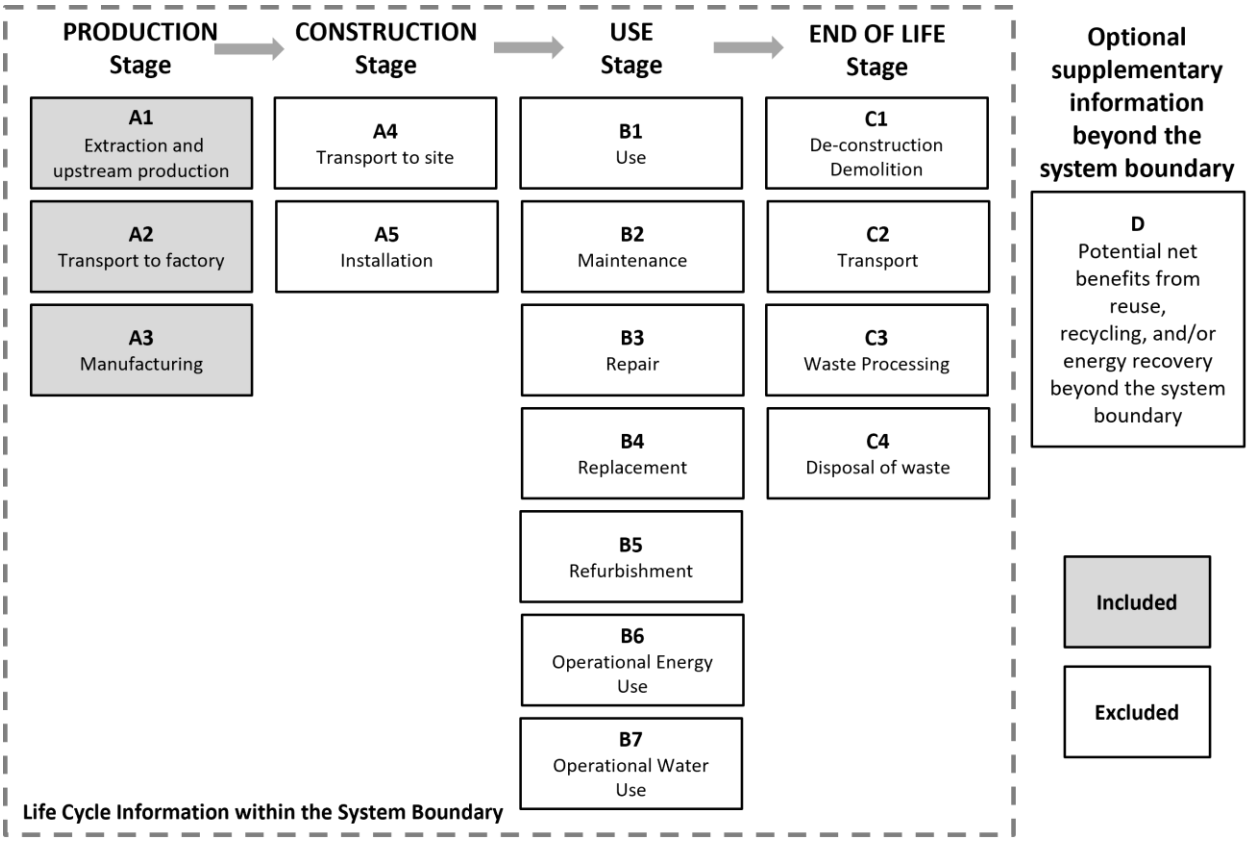


Figure 1: Life Cycle Stages and Modules

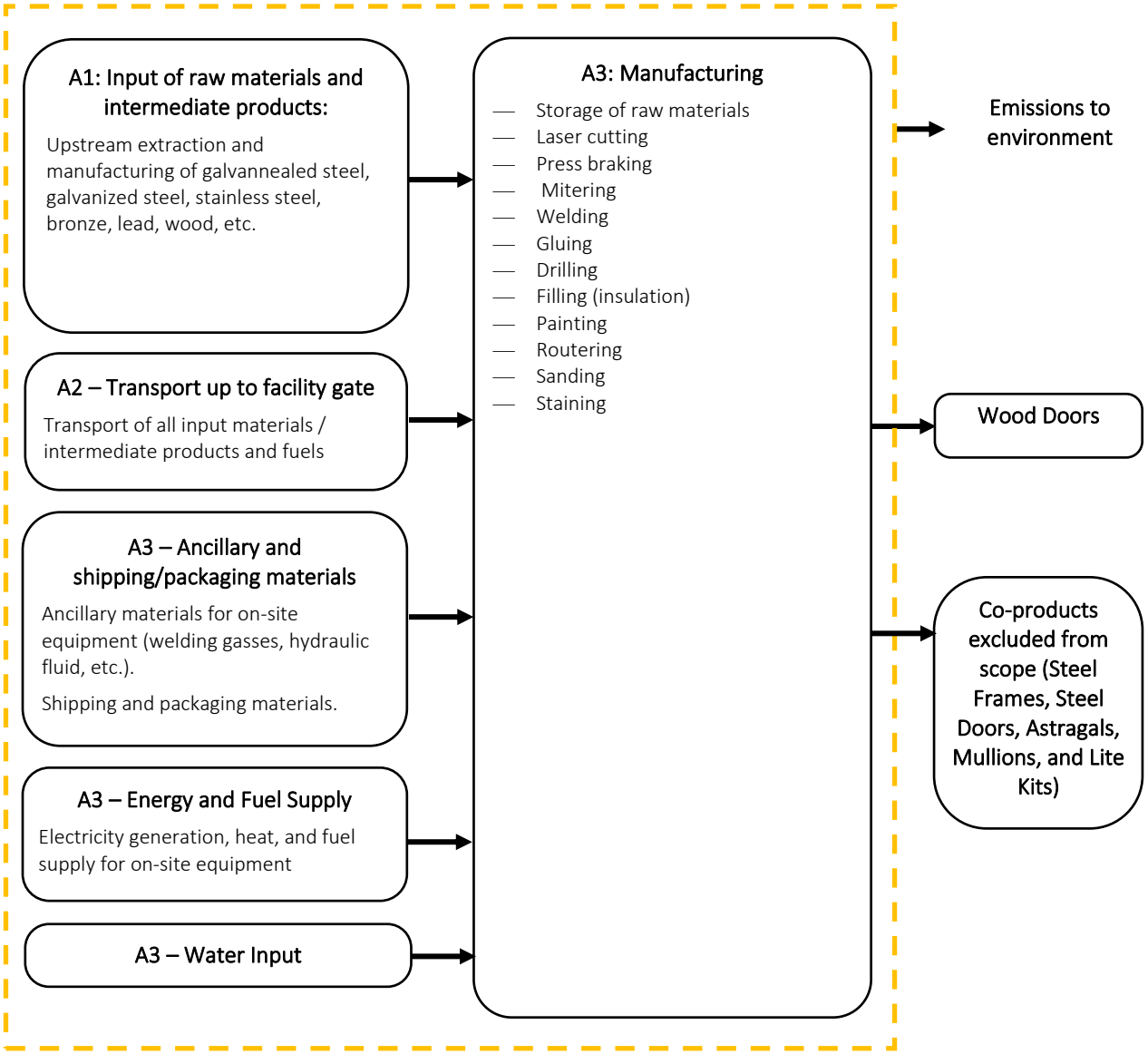


Figure 2: AMBICO Cradle-to-Gate System Boundary

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 NSF's PCR for Interior Architectural Wood Door Leaves (5).

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 NSF PCR requirements (5) 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
Technology Coverage	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. *Technological representativeness is characterized as "high".*
Geographic Coverage	The geographic region considered is the U.S. and Canada. *Geographical representativeness is characterized as "high".*
Time Coverage	Activity (primary) data are representative of the 2023 calendar year (12 months) and include the following: - Manufacturing material inputs for wood doors, -Inbound and outbound transportation data, -Production output and waste *Temporal representativeness is characterized as "high".*

Completeness	All relevant, specific processes were considered and modelled, including inputs (raw materials, energy, and ancillary materials) and outputs (emissions, waste, and production volume). 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 (8). The completeness of the cradle-to-gate process chain in terms of process steps is rigorously assessed for wood doors and documented in the project report.
Consistency	The LCA team conducted mass balances at the facility and product level and selected process levels to maintain high consistency.
Reproducibility	Internal reproducibility is possible since the data and the models are stored and available in the *Athena AMBICO LCI database* developed in SimaPro v.9.5, 2024 (8). 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.
Transparency	Activity and LCI datasets, including data sources, are transparently disclosed in the project report.
Uncertainty	A *sensitivity check* 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 *sensitivity analysis* and *Monte Carlo uncertainty analysis of background data sets.*

5.3 ALLOCATION RULES

This EPD follows the allocation guidelines of ISO 14044 (4) and the NSF PCR (5). AMBICO's manufacturing facility produces various co-products, such as steel frames, steel door leaves, astragals, side lites, and transoms. Production output and packaging data has been provided specific to wood doors, 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 NSF PCR Section 7.1.7 (5) and ISO 21930, 7.1.8 (2). All input/output data reported by AMBICO's manufacturing facility were included in the model. 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 9 presents the "cradle-to-gate" LCA results for a single door leaf unit measuring 1.95m^2 (21 ft^2) at a nominal 44.45 mm (1 ¾ in) thickness, as manufactured by AMBICO. As per the NSF PCR, the US EPA Tool for the Reduction and Assessment of Chemical and Other Environmental Impacts (TRACI), version 2.1, 2012 (9) 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]. 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%.

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.

Table 5 Production stage EPD Results (Total A1 to A3) – Wood Door Group 1 HM, RFXX, and STC33 to STC40

Impact category and inventory indicators	Unit	A1	A2	A3	A1-A3 Total
Global warming potential, GWP 100[1)]	kg CO_2 eq	1.51E+02	1.38E+00	9.78E+01	2.50E+02
Acidification potential, AP[1)]	kg SO_2 eq	5.11E-01	1.65E-02	4.62E-01	9.89E-01
Eutrophication potential, EP[1)]	kg N eq	1.27E-01	9.88E-04	1.75E-01	3.03E-01
Smog formation potential, SFP[1)]	kg O_3 eq	6.11E+00	4.22E-01	4.60E+00	1.11E+01
Ozone depletion potential, ODP[1)]	kg CFC-11 eq	1.59E-06	5.72E-11	1.02E-06	2.62E-06
Abiotic depletion potential for non-fossil mineral resources*[2)]	Kg Sb eq	1.09E+02	0	7.86E-06	1.09E+02
Fossil fuel depletion, FFD*[1)]	MJ surplus, LHV	2.23E+01	2.87E+00	1.46E+02	1.72E+02
Abiotic depletion potential for fossil resources, ADPf*[3)]	MJ, LHV	1.69E+03	1.94E+01	1.23E+03	2.94E+03
Renewable primary resources used as an energy carrier (fuel), RPRE*[4)]	MJ, LHV	1.57E+02	0	2.74E+02	4.31E+02
Renewable primary resources with energy content used as material, RPRM*[4)]	MJ, LHV	1.16E+02	0	4.04E+02	5.20E+02
Non-renewable primary resources used as an energy carrier (fuel), NRPRE*[4)]	MJ, LHV	1.85E+03	1.97E+01	1.98E+03	3.85E+03
Non-renewable primary resources with energy content used as material, NRPRM*[4)]	MJ, LHV	0	0	9.67E+00	9.67E+00
Secondary materials, SM*[4)]	kg	2.14E+01	0	9.02E-03	2.14E+01
Renewable secondary fuels, RSF*[4)]	MJ, LHV	0	0	1.06E+01	1.06E+01
Non-renewable secondary fuels, NRSF*[4)]	MJ, LHV	0	0	0	0
Recovered energy, RE*[4)]	MJ, LHV	0	0	0	0
Consumption of freshwater, FW*[4)]	m^3	5.47E-01	0	1.13E+00	1.68E+00
Hazardous waste disposed, HWD*[4) 5)]	kg	5.99E-05	0	8.74E-04	9.34E-04
Non-hazardous waste disposed, NHWD*[4) 5)]	kg	5.42E+00	0	2.46E+00	7.88E+00
High-level radioactive waste, conditioned, to final repository, HLRW*[4) 6)]	m^3	3.84E-08	0	2.71E-06	2.75E-06
Intermediate- and low-level radioactive waste, conditioned, to final repository, ILLRW*[4) 6)]	m^3	1.84E-05	0	7.64E-05	9.48E-05
Components for re-use, CRU*[4)]	kg	0	0	0	0
Materials for recycling, MR*[4)]	kg	0	0	2.95E+01	2.95E+01
Materials for energy recovery, MER*[4)]	kg	0	0	0	0
Recovered energy exported from the product system, EE*[4)]	MJ, LHV	0	0	0	0
Removals and emissions associated with carbon content of bio-based packaging[4)]	kg CO_2	0	0	-3.30E+01	-3.30E+01
Removals and emissions associated with carbon content of bio-based product[4)]	kg CO_2	-1.21E+01	0	0	-1.21E+01

Table 6 Production stage EPD Results (Total A1 to A3) – Wood Door Group 2 LL2B, TORWD, BR01 to BR03, and STC41 to STC46

Impact category and inventory indicators	Unit	A1	A2	A3	A1-A3 Total
Global warming potential, GWP 100[1)]	kg CO_2 eq	2.29E+02	2.10E+00	9.78E+01	3.29E+02
Acidification potential, AP[1)]	kg SO_2 eq	7.78E-01	2.51E-02	4.62E-01	1.27E+00
Eutrophication potential, EP[1)]	kg N eq	1.93E-01	1.51E-03	1.75E-01	3.70E-01
Smog formation potential, SFP[1)]	kg O_3 eq	9.30E+00	6.43E-01	4.60E+00	1.45E+01
Ozone depletion potential, ODP[1)]	kg CFC-11 eq	2.43E-06	8.71E-11	1.02E-06	3.45E-06
Abiotic depletion potential for non-fossil mineral resources*[2)]	Kg Sb eq	1.66E+02	0	7.86E-06	1.66E+02
Fossil fuel depletion, FFD*[1)]	MJ surplus, LHV	3.40E+01	4.38E+00	1.46E+02	1.85E+02
Abiotic depletion potential for fossil resources, ADPf*[3)]	MJ, LHV	2.58E+03	2.96E+01	1.23E+03	3.83E+03
Renewable primary resources used as an energy carrier (fuel), RPRE*[4)]	MJ, LHV	2.39E+02	0	2.74E+02	5.13E+02
Renewable primary resources with energy content used as material, RPRM*[4)]	MJ, LHV	1.77E+02	0	4.04E+02	5.81E+02
Non-renewable primary resources used as an energy carrier (fuel), NRPRE*[4)]	MJ, LHV	2.82E+03	3.00E+01	1.98E+03	4.83E+03
Non-renewable primary resources with energy content used as material, NRPRM*[4)]	MJ, LHV	0	0	9.67E+00	9.67E+00
Secondary materials, SM*[4)]	kg	3.26E+01	0	9.02E-03	3.26E+01
Renewable secondary fuels, RSF*[4)]	MJ, LHV	0	0	1.06E+01	1.06E+01
Non-renewable secondary fuels, NRSF*[4)]	MJ, LHV	0	0	0	0
Recovered energy, RE*[4)]	MJ, LHV	0	0	0	0
Consumption of freshwater, FW*[4)]	m^3	8.34E-01	0	1.13E+00	1.96E+00
Hazardous waste disposed, HWD*[4) 5)]	kg	9.12E-05	0	8.74E-04	9.65E-04
Non-hazardous waste disposed, NHWD*[4) 5)]	kg	8.25E+00	0	2.46E+00	1.07E+01
High-level radioactive waste, conditioned, to final repository, HLRW*[4) 6)]	m^3	5.86E-08	0	2.71E-06	2.77E-06
Intermediate- and low-level radioactive waste, conditioned, to final repository, ILLRW*[4) 6)]	m^3	2.80E-05	0	7.64E-05	1.04E-04
Components for re-use, CRU*[4)]	kg	0	0	0	0
Materials for recycling, MR*[4)]	kg	0	0	2.95E+01	2.95E+01
Materials for energy recovery, MER*[4)]	kg	0	0	0	0
Recovered energy exported from the product system, EE*[4)]	MJ, LHV	0	0	0	0
Removals and emissions associated with carbon content of bio-based packaging[4)]	kg CO_2	0	0	-3.30E+01	-3.30E+01
Removals and emissions associated with carbon content of bio-based product[4)]	kg CO_2	-1.55E+01	0	0	-1.55E+01

Table 7 Production stage EPD Results (Total A1 to A3) – Wood Door Group 3 LL4B and STC47 to STC52

Impact category and inventory indicators	Unit	A1	A2	A3	A1-A3 Total
Global warming potential, GWP 100[1)]	kg CO_2 eq	3.06E+02	2.80E+00	9.78E+01	4.06E+02
Acidification potential, AP[1)]	kg SO_2 eq	1.04E+00	3.35E-02	4.62E-01	1.53E+00
Eutrophication potential, EP[1)]	kg N eq	2.57E-01	2.01E-03	1.75E-01	4.34E-01
Smog formation potential, SFP[1)]	kg O_3 eq	1.24E+01	8.57E-01	4.60E+00	1.79E+01
Ozone depletion potential, ODP[1)]	kg CFC-11 eq	3.23E-06	1.16E-10	1.02E-06	4.26E-06
Abiotic depletion potential for non-fossil mineral resources*[2)]	Kg Sb eq	2.21E+02	0	7.86E-06	2.21E+02
Fossil fuel depletion, FFD*[1)]	MJ surplus, LHV	4.53E+01	5.83E+00	1.46E+02	1.98E+02
Abiotic depletion potential for fossil resources, ADPf*[3)]	MJ, LHV	3.43E+03	3.95E+01	1.23E+03	4.70E+03
Renewable primary resources used as an energy carrier (fuel), RPRE*[4)]	MJ, LHV	3.19E+02	0	2.74E+02	5.93E+02
Renewable primary resources with energy content used as material, RPRM*[4)]	MJ, LHV	2.36E+02	0	4.04E+02	6.40E+02
Non-renewable primary resources used as an energy carrier (fuel), NRPRE*[4)]	MJ, LHV	3.76E+03	3.99E+01	1.98E+03	5.78E+03
Non-renewable primary resources with energy content used as material, NRPRM*[4)]	MJ, LHV	0	0	9.67E+00	9.67E+00
Secondary materials, SM*[4)]	kg	4.34E+01	0	9.02E-03	4.34E+01
Renewable secondary fuels, RSF*[4)]	MJ, LHV	0	0	1.06E+01	1.06E+01
Non-renewable secondary fuels, NRSF*[4)]	MJ, LHV	0	0	0	0
Recovered energy, RE*[4)]	MJ, LHV	0	0	0	0
Consumption of freshwater, FW*[4)]	m^3	1.11E+00	0	1.13E+00	2.24E+00
Hazardous waste disposed, HWD*[4) 5)]	kg	1.22E-04	0	8.74E-04	9.95E-04
Non-hazardous waste disposed, NHWD*[4) 5)]	kg	1.10E+01	0	2.46E+00	1.35E+01
High-level radioactive waste, conditioned, to final repository, HLRW*[4) 6)]	m^3	7.80E-08	0	2.71E-06	2.79E-06
Intermediate- and low-level radioactive waste, conditioned, to final repository, ILLRW*[4) 6)]	m^3	3.74E-05	0	7.64E-05	1.14E-04
Components for re-use, CRU*[4)]	kg	0	0	0	0
Materials for recycling, MR*[4)]	kg	0	0	2.95E+01	2.95E+01
Materials for energy recovery, MER*[4)]	kg	0	0	0	0
Recovered energy exported from the product system, EE*[4)]	MJ, LHV	0	0	0	0
Removals and emissions associated with carbon content of bio-based packaging[4)]	kg CO_2	0	0	-3.30E+01	-3.30E+01
Removals and emissions associated with carbon content of bio-based product[4)]	kg CO_2	-2.07E+01	0	0	-2.07E+01

Table 8 Production stage EPD Results (Total A1 to A3) – Wood Door Group 4 LL6B, BR04, BR06, and STC53

Impact category and inventory indicators	Unit	A1	A2	A3	A1-A3 Total
Global warming potential, GWP 100[1)]	kg CO_2 eq	3.98E+02	3.64E+00	9.78E+01	4.99E+02
Acidification potential, AP[1)]	kg SO_2 eq	1.35E+00	4.36E-02	4.62E-01	1.86E+00
Eutrophication potential, EP[1)]	kg N eq	3.35E-01	2.61E-03	1.75E-01	5.12E-01
Smog formation potential, SFP[1)]	kg O_3 eq	1.61E+01	1.12E+00	4.60E+00	2.18E+01
Ozone depletion potential, ODP[1)]	kg CFC-11 eq	4.21E-06	1.51E-10	1.02E-06	5.23E-06
Abiotic depletion potential for non-fossil mineral resources*[2)]	Kg Sb eq	2.88E+02	0	7.86E-06	2.88E+02
Fossil fuel depletion, FFD*[1)]	MJ surplus, LHV	5.90E+01	7.59E+00	1.46E+02	2.13E+02
Abiotic depletion potential for fossil resources, ADPf*[3)]	MJ, LHV	4.47E+03	5.14E+01	1.23E+03	5.75E+03
Renewable primary resources used as an energy carrier (fuel), RPRE*[4)]	MJ, LHV	4.15E+02	0	2.74E+02	6.89E+02
Renewable primary resources with energy content used as material, RPRM*[4)]	MJ, LHV	3.07E+02	0	4.04E+02	7.11E+02
Non-renewable primary resources used as an energy carrier (fuel), NRPRE*[4)]	MJ, LHV	4.89E+03	5.20E+01	1.98E+03	6.92E+03
Non-renewable primary resources with energy content used as material, NRPRM*[4)]	MJ, LHV	0	0	9.67E+00	9.67E+00
Secondary materials, SM*[4)]	kg	5.65E+01	0	9.02E-03	5.65E+01
Renewable secondary fuels, RSF*[4)]	MJ, LHV	0	0	1.06E+01	1.06E+01
Non-renewable secondary fuels, NRSF*[4)]	MJ, LHV	0	0	0	0
Recovered energy, RE*[4)]	MJ, LHV	0	0	0	0
Consumption of freshwater, FW*[4)]	m^3	1.45E+00	0	1.13E+00	2.57E+00
Hazardous waste disposed, HWD*[4) 5)]	kg	1.58E-04	0	8.74E-04	1.03E-03
Non-hazardous waste disposed, NHWD*[4) 5)]	kg	1.43E+01	0	2.46E+00	1.68E+01
High-level radioactive waste, conditioned, to final repository, HLRW*[4) 6)]	m^3	1.02E-07	0	2.71E-06	2.81E-06
Intermediate- and low-level radioactive waste, conditioned, to final repository, ILLRW*[4) 6)]	m^3	4.86E-05	0	7.64E-05	1.25E-04
Components for re-use, CRU*[4)]	kg	0	0	0	0
Materials for recycling, MR*[4)]	kg	0	0	2.95E+01	2.95E+01
Materials for energy recovery, MER*[4)]	kg	0	0	0	0
Recovered energy exported from the product system, EE*[4)]	MJ, LHV	0	0	0	0
Removals and emissions associated with carbon content of bio-based packaging[4)]	kg CO_2	0	0	-3.30E+01	-3.30E+01
Removals and emissions associated with carbon content of bio-based product[4)]	kg CO_2	-2.69E+01	0	0	-2.69E+01

Table 9 Production stage EPD Results (Total A1 to A3) – Wood Door Group 5 BR05, BR07, BR08, and STC54 to STC56

Impact category and inventory indicators	Unit	A1	A2	A3	A1-A3 Total
Global warming potential, GWP 100[1)]	kg CO_2 eq	5.28E+02	4.83E+00	9.78E+01	6.30E+02
Acidification potential, AP[1)]	kg SO_2 eq	1.79E+00	5.78E-02	4.62E-01	2.31E+00
Eutrophication potential, EP[1)]	kg N eq	4.44E-01	3.46E-03	1.75E-01	6.23E-01
Smog formation potential, SFP[1)]	kg O_3 eq	2.14E+01	1.48E+00	4.60E+00	2.75E+01
Ozone depletion potential, ODP[1)]	kg CFC-11 eq	5.58E-06	2.01E-10	1.02E-06	6.61E-06
Abiotic depletion potential for non-fossil mineral resources*[2)]	Kg Sb eq	3.82E+02	0	7.86E-06	3.82E+02
Fossil fuel depletion, FFD*[1)]	MJ surplus, LHV	7.82E+01	1.01E+01	1.46E+02	2.35E+02
Abiotic depletion potential for fossil resources, ADPf*[3)]	MJ, LHV	5.93E+03	6.82E+01	1.23E+03	7.23E+03
Renewable primary resources used as an energy carrier (fuel), RPRE*[4)]	MJ, LHV	5.51E+02	0	2.74E+02	8.25E+02
Renewable primary resources with energy content used as material, RPRM*[4)]	MJ, LHV	4.07E+02	0	4.04E+02	8.11E+02
Non-renewable primary resources used as an energy carrier (fuel), NRPRE*[4)]	MJ, LHV	6.49E+03	6.90E+01	1.98E+03	8.54E+03
Non-renewable primary resources with energy content used as material, NRPRM*[4)]	MJ, LHV	0	0	9.67E+00	9.67E+00
Secondary materials, SM*[4)]	kg	7.49E+01	0	9.02E-03	7.49E+01
Renewable secondary fuels, RSF*[4)]	MJ, LHV	0	0	1.06E+01	1.06E+01
Non-renewable secondary fuels, NRSF*[4)]	MJ, LHV	0	0	0	0
Recovered energy, RE*[4)]	MJ, LHV	0	0	0	0
Consumption of freshwater, FW*[4)]	m^3	1.92E+00	0	1.13E+00	3.05E+00
Hazardous waste disposed, HWD*[4) 5)]	kg	2.10E-04	0	8.74E-04	1.08E-03
Non-hazardous waste disposed, NHWD*[4) 5)]	kg	1.90E+01	0	2.46E+00	2.14E+01
High-level radioactive waste, conditioned, to final repository, HLRW*[4) 6)]	m^3	1.35E-07	0	2.71E-06	2.85E-06
Intermediate- and low-level radioactive waste, conditioned, to final repository, ILLRW*[4) 6)]	m^3	6.45E-05	0	7.64E-05	1.41E-04
Components for re-use, CRU*[4)]	kg	0	0	0	0
Materials for recycling, MR*[4)]	kg	0	0	2.95E+01	2.95E+01
Materials for energy recovery, MER*[4)]	kg	0	0	0	0
Recovered energy exported from the product system, EE*[4)]	MJ, LHV	0	0	0	0
Removals and emissions associated with carbon content of bio-based packaging[4)]	kg CO_2	0	0	-3.30E+01	-3.30E+01
Removals and emissions associated with carbon content of bio-based product[4)]	kg CO_2	-3.57E+01	0	0	-3.57E+01

Notes:

[1)] Calculated as per U.S EPA TRACI 2.1, v1.05, SimaPro v.9.5.0.2 GWP-100 (8), excludes biogenic CO_2 removals and emissions associated with biobased products, including bio-based packaging. Biogenic carbon content of packaging materials is reported separately. CO_2 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 (9). FFD is required in LEED V4.1 MR Credit: Building Product Disclosure and Optimization – Environmental Product Declarations (10).

[2)] Calculated as per CML-IA Baseline v3.05, SimaPro v.9.5.0.2 (8).

[3)] Calculated as per CML-IA baseline, V4.7, SimaPro v.9.5.0.2. ADP_f is also required in LEED v4.0/v4.1 MR2 Credit: Building Product Disclosure and Optimization – Environmental Product Declarations (11), (10).

[4)] Calculated as per ACLCA ISO 21930 Guidance (12).

[5)] Significant data limitations currently exist within the LCI data used to generate waste metrics for Life Cycle Assessments and Environmental Product Declarations. The waste metrics were calculated in a way conformant with the requirements of ISO 21930:2017, but these values represent rough estimates and are for informational purposes only. As such, no decisions regarding actual cradle-to-gate waste performance between products should be derived from these reported values (5).

[6)] 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 wood doors represent a "cradle-to-gate" environmental profile for one single door leaf unit measuring 1.95m^2 (21 ft^2) at a nominal 44.45 mm (1 ¾ in) thickness.

A1 – Material Extraction and Upstream Production is the primary contributor to the environmental impact of AMBICO's wood doors, contributing 46% to 70% of the overall potential environmental impact, depending on the impact category. The A1 impacts are primarily dominated by the galvannealed steel material input.

A3 – Manufacturing also contributes significantly to the potential environmental impact, accounting for 30% to 54% 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 wood doors.

8 DECLARATION TYPE

This cradle-to-gate EPD applies to wood doors 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 doors falls under the description:

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

9 EPD COMPARABILITY LIMITATION STATEMENT

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

- Environmental declarations from different programmes may not be comparable;
- This EPD meets all comparability requirements stated in ISO 14025:2006. However, differences in certain assumptions, data quality, and variability between LCA data sets may still exist. As such, caution should be exercised when evaluating EPDs from different manufacturers or programs, as the EPD results may not be entirely comparable. Any EPD comparison must be carried out at the construction works level per ISO 21930:2017 guidelines. The results of this EPD reflect an average performance by the product and its actual impacts may vary on a case-to-case.

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. NSF International. Product Category Rule for Environmental Product Declarations. PCR for Interior Architectural Wood Door Leaves. Version 6.0. December 2022.

6. ASTM Program Operator for Product Category Rules (PCRs) and Environmental Product Declarations (EPDs), General Program Instructions, April 2020.

7. 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.

8. PRé 2021.SimaPro LCA Software v 9.5, 2024, *https://simapro.com/*.

9. 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.*

10. LEED v4.1, MRc2: Building product disclosure and optimization, Environmental Product Declarations,. *https://leeduser.buildinggreen.com/credit/NC-v4.1/MRc2#tab-credit-language .*

11. LEED v4, MRc2: Building product disclosure and optimization, Environmental Product Declarations, *https://leeduser.buildinggreen.com/credit/NC-v4/MRc2#tab-credit-language.*

12. ACLCA 2019, Guidance to Calculating Non-LCIA Inventory Metrics in Accordance with ISO 21930:2017. The American Centre for Life Cycle Assessment. May, 2019.

13. ISO 14025: 2006 Environmental labeling and declarations - Type III environmental declarations - Principles and procedures.