Declaration Owner
Forte Opening Solutions
4301 Anchor Plaza Pkwy
Suite 220
Tampa, Florida 33634
www.forteopenings.com

Product

This declaration represents the production-weighted average wood door leaf, manufactured by Forte Opening Solutions at the following locations:

- Forte Opening Solutions – Mason City, IA
- Forte Opening Solutions – Jefferson City, TN
- Forte Opening Solutions – London, Ontario
- Forte Opening Solutions – Marshfield, WI
- Forte Opening Solutions – Northumberland, PA
- Forte Opening Solutions – Saint-Ephrem, Quebec

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Declared Unit

The declared unit is a wood door leaf, measuring 21 ft^2 (1.95 m2) at a nominal 1-3/4 inch (44.45 mm) thickness. Results represent a production weighted average wood door leaf.

EPD Number and Period of Validity

SCS-EPD-07658
EPD Valid February 16, 2022 through February 15, 2027
Version Date: November 6, 2024

Product Category Rule

Product Category Rule for Preparing an Environmental Product Declaration for Interior Architectural Wood Door Leaves

Program Operator

SCS Global Services
2000 Powell Street, Ste. 600, Emeryville, CA 94608
+1.510.452.8000 | www.SCSglobalServices.com

Declaration Owner:	Forte Opening Solutions
Address:	4301 Anchor Plaza Pkwy, Suite 220, Tampa, Florida 33634
Declaration Number:	SCS-EPD-07658
Declaration Validity Period:	EPD Valid February 16, 2022 through February 15, 2027
Version Date:	November 6, 2024
Program Operator:	SCS Global Services
Declaration URL Link:	https://www.scsglobalservices.com/certified-green-products-guide
LCA Practitioner:	Gerard Mansell, SCS Global Services
LCA Software:	openLCA v1.10 and ecoinvent v3.7 database
Independent critical review of the LCA and data, according to ISO 14044 and ISO 14071	☐ internal ☒ external
LCA Reviewer:	Thomas Gloria, Ph.D., Industrial Ecology Consultants
Product Category Rule:	Product Category Rule for Preparing an Environmental Product Declaration for Interior Architectural Wood Door Leaves.
PCR Review conducted by:	Jamie Meil, Athena Sustainable Materials Institute (Review Chair) Email: jamie.meil@athenasmi.org
Independent verification of the declaration and data, according to ISO 14025 and the PCR	☐ internal ☒ external
EPD Verifier:	Thomas Gloria, Ph.D., Industrial Ecology Consultants
Declaration Contents:	

Disclaimers: *This EPD conforms to ISO 14025, 14040, 14044, and 21930:2007.*

Scope of Results Reported: *The PCR requirements limit the scope of the LCA metrics such that the results exclude environmental and social performance benchmarks and thresholds, and exclude impacts from the depletion of natural resources, land use ecological impacts, ocean impacts related to greenhouse gas emissions, risks from hazardous wastes and impacts linked to hazardous chemical emissions.*

Accuracy of Results: *Due to PCR constraints, this EPD provides estimations of potential impacts that are inherently limited in terms of accuracy.*

Comparability: *The PCR this EPD was based on was not written to support comparative assertions. EPDs based on different PCRs, or different calculation models, may not be comparable. When attempting to compare EPDs or life cycle impacts of products from different companies, the user should be aware of the uncertainty in the final results, due to and not limited to, the practitioner's assumptions, the source of the data used in the study, and the specifics of the product modeled.*

Forte Opening Solutions

Forte™ Opening Solutions is a leading provider of built-to-order wood doors and components, serving a wide range of commercial and institutional markets, including healthcare, hospitality, education, and government. With a rich legacy of 134 years and a portfolio that brings together iconic brands like Marshfield DoorSystems, Algoma Hardwoods, Mohawk Doors, Baillargeon, and Harring, Forte offers tailored wood door solutions, ranging from authentic stile and rail designs to highly customizable veneer options. Our rebranding from Masonite Architectural to Forte Opening Solutions marks an exciting new chapter in our journey, symbolizing our strength, expertise, and ongoing commitment to providing seamless customer experiences. Forte stands for more than just doors—it represents a dedication to delivering optimal performance, exceptional aesthetics, and trusted support at every touchpoint.

Product Scope

The Forte Opening Solutions door cores, surface materials, and specialty options for Flush doors and Stile & Rail doors included in this EPD are provided in Table 1 below.

Table 1. *Types of door cores, surface materials, and specialty options covered in this EPD.*

Flush Wood Door Leaves		
Door Core	**Surface Material**	**Specialty Options**
Particleboard	Wood Veneer	Acoustic; Lead-lined; Factory Glazing
	HDF/Hardboard	Factory Glazing
	Molded Panel	Factory Glazing
	High Pressure Decorative Laminate	Acoustic; Lead-lined; Factory Glazing
	Medium Density Overlay	Acoustic; Lead-lined; Factory Glazing
	High Impact (PVC)	Acoustic; Lead-lined; Factory Glazing
Structural Composite Lumber	Wood Veneer	Acoustic; Lead-lined; Factory Glazing
	HDF/Hardboard	Factory Glazing
	Molded Panel	Factory Glazing
	High Pressure Decorative Laminate	Acoustic; Lead-lined; Factory Glazing
	Medium Density Overlay	Acoustic; Lead-lined; Factory Glazing
	High Impact	Acoustic; Lead-lined; Factory Glazing
Fire-Resistant Composite	Wood Veneer	Acoustic; Lead-lined; Factory Glazing
	HDF/Hardboard	Factory Glazing
	Molded Panel	Factory Glazing
	High Pressure Decorative Laminate	Acoustic; Lead-lined; Factory Glazing
	Medium Density Overlay	Acoustic; Lead-lined; Factory Glazing
	High Impact (PVC)	Acoustic; Lead-lined; Factory Glazing
Laminated Veneer Lumber	Wood Veneer	Factory Glazing
	HDF/Hardboard	Factory Glazing
	High Pressure Laminate	Factory Glazing
	Medium Density Overlay	Factory Glazing
Hollow Core	Wood Veneer	Factory Glazing
	HDF/Hardboard	Factory Glazing
	Molded Panel	Factory Glazing
Stile & Rail Wood Doors		
Door Core	**Surface Material**	**Specialty Options**
Structural Composite Lumber/ Medium Density Fiberboard/ Particleboard	Wood Veneer	Factory Glazing
	Painted High Density Fiberboard	Factory Glazing
Fire-Resistant Composite	Wood Veneer	Factory Glazing
	Painted High Density Fiberboard	Factory Glazing

Material Content

The approximate material composition of a production-weighted representative door is shown below in Table 2.

Table 2. *Material composition of a production-weighted average wood door leaf.*

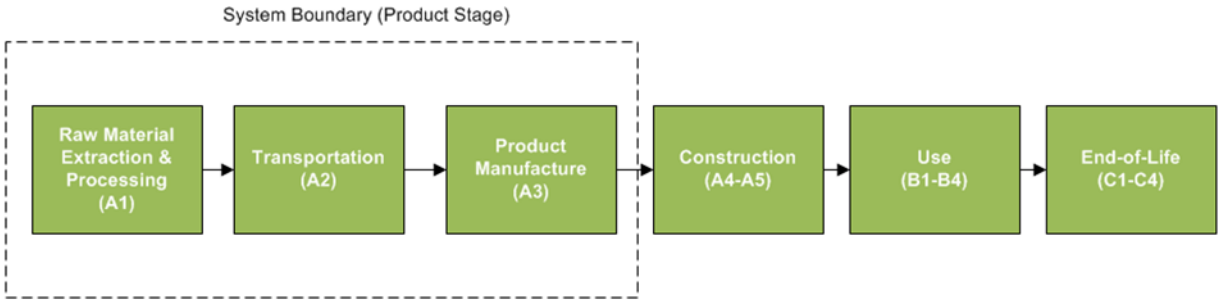
Material Type	Average Weight (kg)	Value (%)
PRODUCT		
Engr. Wood	30.8	63%
Wood	14.0	28%
Mineral Core	2.99	6.1%
Adhesives/Catalysts	0.695	1.4%
Polymers	0.258	0.53%
Lead	4.43×10^{-2}	0.09%
Paper	1.38×10^{-2}	0.028%
Plastic	5.22×10^{-3}	0.011%
Stains/Coatings	0.231	0.47%
TOTAL (Product)	**49.0**	**100%**
PACKAGING		
Corrugated	9.07×10^{-2}	32%
Plastics	1.95×10^{-2}	6.8%
Pallet	0.177	62%
TOTAL (Packaging)	**0.287**	**100%**

Life Cycle Assessment Stages And Reported Information

The EPD represents the potential environmental impacts from the production of the wood door leaf (i.e., cradle-to-gate). The production stage of the product life cycle includes:

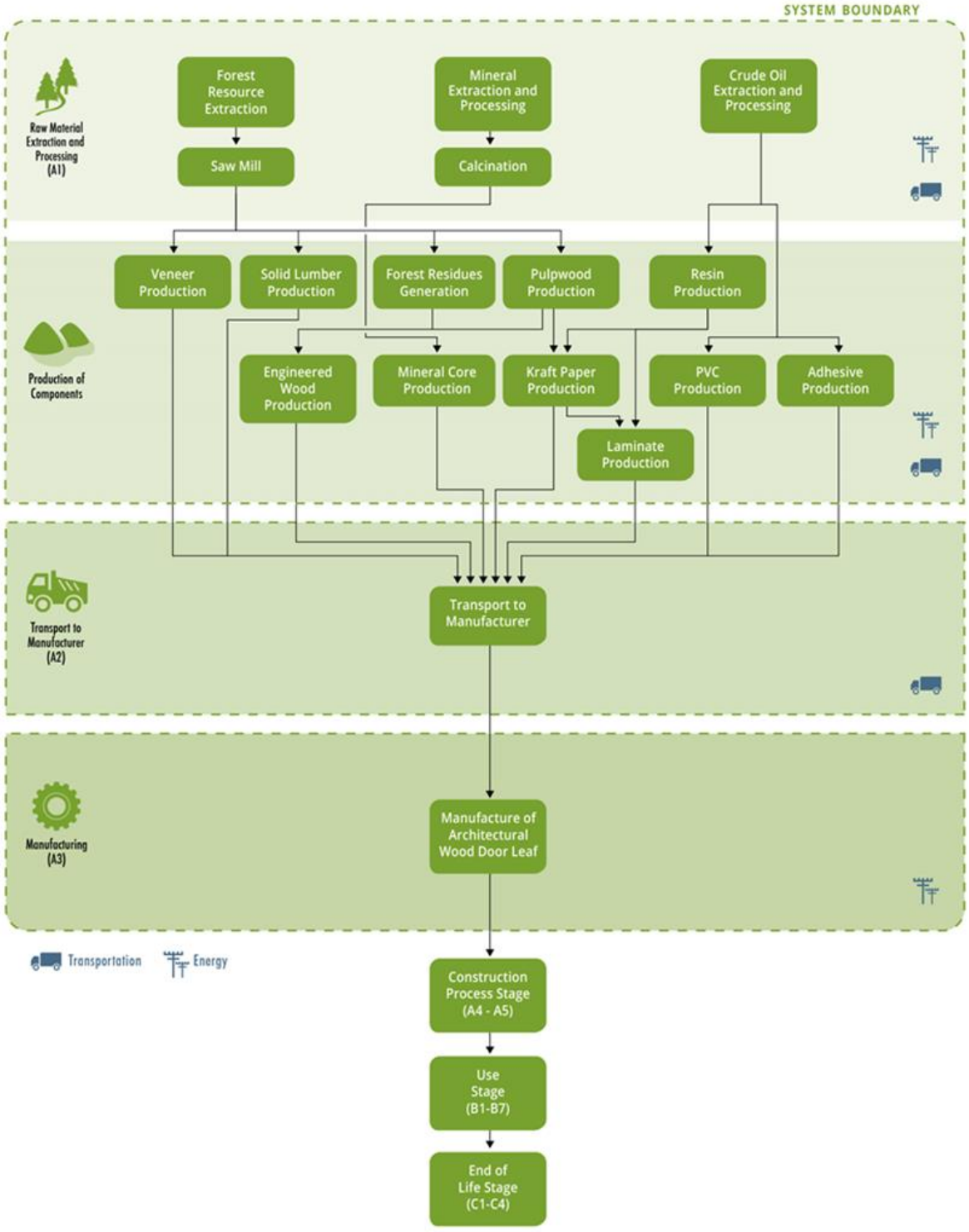
- **A1** – The extraction and processing of raw materials and the manufacture of material components (e.g., particleboard, wood veneer).
- **A2** – The transportation of raw materials from source to manufacturing site.
- **A3** – The manufacturing of wood door leaves. Packaging is included in this module.

An overview of the life cycle stages included is shown in the figure below. Product installation, use, maintenance, and disposal are not included.



Product Life Cycle Flow Diagram

The diagram below is a representation of the most significant contributions to the production of wood door leaves.



Life Cycle Inventory

In accordance with the PCR, the following aggregated inventory flows are included in the LCA:

- Primary energy consumption
- Use of renewable and nonrenewable material resources
- Consumption of freshwater
- Hazardous Waste
- Non-hazardous Waste

All results are calculated using the OpenLCA v1.10 model using primary and secondary inventory data. Classification for *Use of Renewable Material Resources* is based on review of elementary flows and resources considered renewable on a human time scale. Elementary flows related to use of minerals, and land occupation were not included. Water consumption is also not included as this is reported separately.

Table 3. *Results for resource use, wastes, and output flows for the declared unit for wood door leaves.*

Parameter	Units	Raw Materials (A1)	Upstream Transport (A2)	Manufacturing (A3)	A4-A5	B1-B7	C1-C4
Energy Resources							
Primary energy demand	MJ, HHV	1,250	126	442	MND	MND	MND
	%	69%	7%	24%			
Nonrenewable, fossil	MJ, HHV	505.48	123.49	377.37	MND	MND	MND
	%	50%	12%	37%			
Nonrenewable, nuclear	MJ, HHV	25.75	1.41	34.26	MND	MND	MND
	%	42%	2.3%	56%			
Renewable, except biomass	MJ, HHV	18.2	0.960	14.0	MND	MND	MND
	%	55%	2.9%	42%			
Renewable, biomass	MJ, HHV	695.61	0.40	16.00	MND	MND	MND
	%	98%	0.056%	2.2%			
Material resources							
Nonrenewable materials	kg	0.00	0.00	0.00	MND	MND	MND
	%	0.00	0.00	0.00			
Renewable materials	lg	37.9	$2.13x10^{-2}$	0.946	MND	MND	MND
	%	0.980	$5.50x10^{-4}$	$2.40x10^{-2}$			
Use fresh water	m^3	2.36	$8.24x10^{-2}$	1.02	MND	MND	MND
	%	68%	2.4%	29%			
Wastes							
Hazardous waste disposed	kg	$6.18x10^{-4}$	$3.08x10^{-4}$	$2.16x10^{-4}$	MND	MND	MND
	%	54%	27%	19%			
Nonhazardous waste disposed	kg	4.44	5.56	1.63	MND	MND	MND
	%	38%	48%	14%			

Life Cycle Impact Assessment

Results are reported according to the LCIA methodology of Tool for the Reduction and Assessment of Chemical and Other Environmental Impacts (TRACI version 2.1).

Table 4. *Production weighted average Life Cycle Impact Assessment (LCIA) results for the declared unit for wood door leaves.Values in parenthesis show the percent contribution of each information module to the total cradle-to-gate life cycle result for each impact category. Values may not sum to the exact totals due to rounding.*

Parameter	Units	Raw Materials (A1)	Upstream Transport (A2)	Manufacturing (A3)	A4-A5	B1-B7	C1-C4
Impact Indicator							
Global warming	kg CO_2 eq	35.6	7.82	25.8	MND	MND	MND
	%	51%	11%	37%			
Acidification	kg SO_2 eq	0.213	$3.55x10^{-2}$	0.104	MND	MND	MND
	%	61%	10%	29%			
Eutrophication	kg N eq	0.124	$8.70x10^{-3}$	$6.46x10^{-2}$	MND	MND	MND
	%	63%	4.4%	33%			
Smog formation	kg O_3 eq	3.46	0.858	1.19	MND	MND	MND
	%	63%	16%	22%			
Ozone depletion	kg CFC-11 eq	$3.48x10^{-6}$	$1.82x10^{-6}$	$1.61x10^{-6}$	MND	MND	MND
	%	50%	26%	23%			
Fossil fuel depletion	MJ, surplus	49.0	16.6	40.3	MND	MND	MND
	%	46%	16%	38%			

Supporting Technical Information

Data sources

Unit processes are developed with OpenLCA v1.10 software, drawing upon data from multiple sources. Primary data were provided by Forte Opening Solutions for their manufacturing processes. The primary sources of secondary LCI data are from the Ecoinvent v3.7 Life-Cycle Inventory Database.

Table 5. *Data sources used for the LCA.*

Component	Dataset	Data Source	Publication Date
PRODUCT			
Mineral core	stone wool production, packed | stone wool, packed | Cutoff, S - RoW	EI v3.7	2020
	kaolin production | kaolin | Cutoff, S/RoW	EI v3.7	2020
	expanded perlite production | expanded perlite | Cutoff, S/RoW	EI v3.7	2020
	potato starch production | potato starch | Cutoff, S/RoW	EI v3.7	2020
	cellulose fibre production | cellulose fibre | Cutoff, S/RoW	EI v3.7	2020
	silica sand production | silica sand | Cutoff, S/RoW	EI v3.7	2020
	Electricity, medium voltage, per kWh - U.S./U.S.	EI v3.7	2020
Particle board	particleboard production, uncoated, average glue mix | particleboard, uncoated | Cutoff, S/RoW	EI v3.7	2020
Hollow core	cellulose fibre production | cellulose fibre | Cutoff, S/RoW	EI v3.7	2020
	potato starch production | potato starch | Cutoff, S/RoW	EI v3.7	2020
	methylene diphenyl diisocyanate production | methylene diphenyl diisocyanate | Cutoff, S/RoW	EI v3.7	2020
Structural composite lumber	structural timber production | structural timber | Cutoff, S/RoW	EI v3.7	2020
High pressure decorative laminate	cellulose fibre production | cellulose fibre | Cutoff, S/RoW	EI v3.7	2020
	urea formaldehyde resin production | urea formaldehyde resin | Cutoff, S/RoW	EI v3.7	2020
	polyester resin production, unsaturated | polyester resin, unsaturated | Cutoff, S/RoW	EI v3.7	2020
	acrylic binder production, product in 34% solution state | acrylic binder, without water, in 34% solution state | Cutoff, S/RoW	EI v3.7	2020
Medium density overlay	plywood production | plywood | Cutoff, S/RoW	EI v3.7	2020
Medium density fiberboard	medium density fibre board production, uncoated | medium density fibreboard | Cutoff, S/RoW	EI v3.7	2020
Plywood	plywood production | plywood | Cutoff, S/RoW	EI v3.7	2020
Hardwood	sawnwood production, hardwood, dried (u=10%), planed | sawnwood, hardwood, dried (u=10%), planed | Cutoff, S/RoW	EI v3.7	2020
Softwood	sawnwood production, softwood, dried (u=10%), planed | sawnwood, softwood, dried (u=10%), planed | Cutoff, S/RoW	EI v3.7	2020
Catalysts/Adhesives	chemical production, organic | chemical, organic | Cutoff, S/GLO	EI v3.7	2020
	methylene diphenyl diisocyanate production | methylene diphenyl diisocyanate | Cutoff, S/RoW	EI v3.7	2020
Paint	market for titanium dioxide | titanium dioxide | Cutoff, S/RoW	EI v3.7	2020
	chemical production, organic | chemical, organic | Cutoff, S/GLO	EI v3.7	2020
	market group for tap water | tap water | Cutoff, S/GLO	EI v3.7	2020
Primer	market for titanium dioxide | titanium dioxide | Cutoff, S/RoW	EI v3.7	2020
	limestone production, crushed, washed | limestone, crushed, washed | Cutoff, S/RoW	EI v3.7	2020

Component	Dataset	Data Source	Publication Date
	kaolin production | kaolin | Cutoff, S/RoW	EI v3.7	2020
	market group for tap water | tap water | Cutoff, S/GLO	EI v3.7	2020
PACKAGING			
Wood	EUR-flat pallet production | EUR-flat pallet | Cutoff, S/RoW	EI v3.7	2020
Pulp	containerboard production, linerboard, kraftliner | containerboard, linerboard | Cutoff, S/RoW	EI v3.7	2020
LDPE	packaging film production, low density polyethylene | packaging film, low density polyethylene | Cutoff, S/RoW	EI v3.7	2020
RESOURCES			
Grid electricity – Mason City, IA	Electricity, medium voltage, per kWh - MROW/MROW	EI v3.7; eGRID	2020; 2018
Grid electricity – Jefferson City, TN	Electricity, medium voltage, per kWh - SRTV/SRTV	EI v3.7; eGRID	2020; 2018
Grid electricity – Marshfield, WI	Electricity, medium voltage, per kWh - MROE/MROE	EI v3.7; eGRID	2020; 2018
Grid electricity – Northumberland, PA	Electricity, medium voltage, per kWh - RFCE/RFCE	EI v3.7; eGRID	2020; 2018
Grid electricity – London, ON	market for electricity, medium voltage | electricity, medium voltage | Cutoff, S/CA-ON	EI v3.7	2020
Grid electricity – St. Ephrem, QC	market for electricity, medium voltage | electricity, medium voltage | Cutoff, S/CA-QC	EI v3.7	2020
Natural gas	heat production, natural gas, at boiler modulating >100kW | heat, district or industrial, natural gas | Cutoff, S/RoW	EI v3.7	2020
Diesel	diesel, burned in building machine | diesel, burned in building machine | Cutoff, S/GLO	EI v3.7	2020
Fuel oil	heat production, light fuel oil, at industrial furnace 1MW | heat, district or industrial, other than natural gas | Cutoff, S/CA-QC	EI v3.7	2020
Propane	heat production, propane, at industrial furnace >100kW | heat, district or industrial, other than natural gas | Cutoff, S/RoW	EI v3.7	2020
TRANSPORTATION			
Road transport	transport, freight, lorry 16-32 metric ton, EURO4 | transport, freight, lorry 16-32 metric ton, EURO4 | Cutoff, S/RoW	EI v3.7	2020

Allocation

This study follows the allocation guidelines of ISO-14044 and allocation rules specified in the PCR and sought to minimize the use of allocation wherever possible. In general, allocation of resource use at the facility was based on volume.

Impacts from transportation were allocated based on the mass of materials, and the distance transported.

For materials with recycled content, the Recycled Content Method was followed, whereby only the impacts from reprocessing the recycled material is included (impacts from the previous life cycle are not).

Cut-off criteria:

According to the PCR, processes contributing greater than 1% of the total environmental impact indicator for each impact must be included in the inventory. In the present study, except as noted, all known materials and processes were included in the life cycle inventory.

Data Quality

Table 6. *Data quality assessment of Life Cycle Inventory.*

Data Quality Parameter	Data Quality Discussion
Time-Related Coverage: Age of data and the minimum length oftime over which data is collected	The most recent available data are used, based on other considerations such as data quality and similarity to the actual operations. Typically, these data are less than 5 years old (typically 2016). All the data used represented an average of at least one year's worth of data collection, and up to three years in some cases. Manufacturer-supplied data (primary data) are based on annual production for 2020.
Geographical Coverage: Geographical area from which data for unit processes is collected to satisfy the goal of the study	The data used in the analysis provide the best possible representation available with current data. Actual processes for upstream operations are primarily North American. Surrogate data used in the assessment are representative of North American or European operations. Data representative of European operations are considered sufficiently similar to actual processes.
Technology Coverage: Specific technology or technology mix	For the most part, data are representative of the actual technologies used for processing, transportation, and manufacturing operations. Representative fabrication datasets, specific to the type of material, are used to represent the actual processes, as appropriate.
Precision: Measure of the variability of the data valuesfor each data expressed	Precision of results are not quantified due to a lack of data. Data collected for operations were typically averaged for one or more years and over multiple operations, which is expected to reduce the variability of results.
Completeness: Percentage of flow that is measured orestimated	The LCA model included all known mass and energy flows for production of the wood door leaf products. In some instances, surrogate data used to represent upstream operations may be missing some data which is propagated in the model. No known processes or activities contributing to more than 1% of the total environmental impact for each indicator are excluded.
Representativeness: Qualitative assessment of the degreeto which the data set reflects the true population of interest	Data used in the assessment represent typical or average processes as currently reported from multiple data sources and are therefore generally representative of the range of actual processes and technologies for production of these materials. Considerable deviation may exist among actual processes on a site-specific basis; however, such a determination would require detailed data collection throughout the supply chain back to resource extraction.
Consistency: Qualitative assessment of whether the study methodology is applied uniformly tothe various components of the analysis	The consistency of the assessment is considered to be high. Data sources of similar quality and age are used; with a bias towards Ecoinvent v3.7 data where available. Different portions of the product life cycle are equally considered.
Reproducibility: Qualitative assessment of the extent to which information about the methodologyand data values would allow an independent practitioner to reproduce theresults reported in the study	Based on the description of data and assumptions used, this assessment would be reproducible by other practitioners. All assumptions, models, and data sources are documented.
Sources of the Data Description of all primary and secondary data sources	Data representing energy use at the Forte Opening Solutions manufacturing facility represents an annual average and are considered of high quality due to the length of time over which these data are collected, as compared to a snapshot that may not accurately reflect fluctuations in production. For secondary LCI datasets, Ecoinvent v3.7 LCI data are used.
Uncertainty of the Information Uncertainty related to data, models, and assumptions	Uncertainty related to materials in the product and packaging is low. Actual supplier data for upstream operations was not available for all suppliers and the study relied upon the use of existing representative datasets. These datasets contained relatively recent data (<10 years) but lacked geographical representativeness. Uncertainty related to the impact assessment methods used in the study are high. The impact assessment method required by the PCR includes impact potentials, which lack characterization of providing and receiving environments or tipping points.

Additional Environmental Information

ADDITIONAL ENVIRONMENTAL INFORMATION

Forte Opening Solutions is committed to environmental responsibility and reducing impacts by using wood fiber from well managed forests and other renewable biobased materials in all of its interior door products, and improving indoor air quality by using adhesives and binders that contain low levels of VOCs (volatile organic compounds). These efforts, and the third-party certifications, are described below. Ultimately, all Forte Opening Solutions doors are available with at least one of these environmental attributes:

- Certified Wood
- Low-Emitting Materials

CERTIFIED WOOD

Forte Opening Solutions supports sustainable forestry in order to help protect the future of forests. That is why we are FSC® certified.

Forte Opening Solutions offers products with FSC certified wood upon request, including FSC 100%, FSC Mix Credit, and FSC Mix %.

LOW-EMITTING MATERIALS

Forte Opening Solutions wood door leaves support a healthy indoor environment through emissions testing and certification under the Indoor Advantage™ Gold program. The test methods determine individual volatile organic compounds (VOC) emissions based on the California Office of Environmental Health Hazard Assessment's (OEHHA) Chronic Reference Exposure Levels (CRELs). The wood door leaves certified Indoor Advantage™ Gold include doors constructed with the following door cores: Acoustic, Agrifiber, Fire Resistant Composite, High Density Fiberboard (HDF), Hollow Core, Laminated Veneer Lumber (LVL), Particleboard, Staved Lumber, Structural Composite Lumber (SCL), and with the following door surfaces: Wood Veneers; High Impact Surfaces; Laminates; Primed, Painted, and Transparent Finish Hardboard (Embossed and Molded), Primed Medium Density Overlay (MDO), and Hardboard. Factory finished Stile & Rail doors are also certified to Indoor Advantage™ Gold.

A list of the certifications maintained by Forte Opening Solutions is shown below. Note, some limitations apply and you should consult with a representative of Forte Opening Solutions to ensure your product selection will meet your project's needs.

Indoor Advantage™ Gold Certificates		
SCS-IAQ-04499	SCS-IAQ-04500	SCS-IAQ-04501

References

1. Life Cycle Assessment of Wood Door Leaves and Frames. February 2022.
2. ISO 14025:2006 Environmental labels and declarations – Type III environmental declarations – Principles and Procedures.
3. ISO 14040: 2006 Environmental Management – Life cycle assessment – Principles and Framework
4. ISO 14044:2006/Amd 1:2017/Amd 2:2020 Environmental Management – Life cycle assessment – Requirements and Guidelines.
5. ISO 21930: 2007 Sustainability in buildings and civil engineering works — Core rules for environmental product declarations of construction products and services.
6. Product Category Rules for Preparing an Environmental Product Declaration for Interior Architectural Wood Door Leaves. ASTM/NSF Sustainability. Valid until Feb 28, 2022.
7. SCS Type III Environmental Declaration Program: Program Operator Manual. V11-0. November 2021. SCS Global Services.
8. Tool for the Reduction and Assessment of Chemical and Other Environmental Impacts (TRACI). Dr. Bare, J., https://www.epa.gov/chemical-research/tool-reduction-and-assessment-chemicals-and-other-environmental-impacts-traci
9. Ecoinvent Centre (2020) ecoinvent data from v3.7. Swiss Center for Life Cycle Inventories, Dübendorf, 2020, http://www.ecoinvent.org.

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