ENVIRONMENTAL PRODUCT DECLARATION

ARCHITECTURAL WOOD DOOR LEAF

INTERIOR FLUSH DOOR, INTERIOR STILE AND RAIL DOOR

Horizontal Grain, 5-Ply Flush Door

Eggers Industries

Sustainability touches the lifeblood of Eggers Industries. Since our founding in 1884, the ability to obtain and maintain a steady supply of timber products has been and continues to be vital to our existence. We recognize the necessity to keep this renewable resource abundant and readily available to everyone who uses it whether for work, livelihood or pleasure.

We embrace sustainable practices and emphasize continuous improvement and the utilization of Lean Manufacturing to reduce waste, improve our processes and products so that we can be a good steward for generations to come.

For additional information, visit www.eggersindustries.com.

UL CERTIFIED ENVIRONMENTAL PRODUCT DECLARATION UL.COM/EPD

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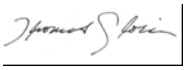
Architectural Wood Door Leaves
Interior Flush, Interior Stile and Rail

According to ISO 14025

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

PROGRAM OPERATOR	UL Environment
DECLARATION HOLDER	Eggers Industries
DECLARATION NUMBER	4787126066.101.1
DECLARED PRODUCT	Eggers Industries Architectural Wood Door Leaf
REFERENCE PCR	PCR for preparing an EPD for interior architectural wood door leaves ASTM, 2015
DATE OF ISSUE	February 16, 2017
PERIOD OF VALIDITY	5 Years
CONTENTS OF THE DECLARATION	Product definition and information about building physics Information about basic material and the material's origin Description of the product's manufacture Indication of product processing Information about the in-use conditions Life cycle assessment results Testing results and verifications

The PCR review was conducted by:	Review Panel Jamie Meil, Athena Sustainable Materials Institute cert@astm.org
This declaration was independently verified in accordance with ISO 14025 by Underwriters Laboratories ☐ INTERNAL ☒ EXTERNAL	 Wade Stout, UL Environment
This life cycle assessment was independently verified in accordance with ISO 14044 and the reference PCR by:	 Thomas P Gloria, Industrial Ecology Consultants

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Company Description

In two Wisconsin manufacturing plants, Eggers Industries employs the highest level of artistic craftsmanship alongside hot press technology and bonded cores to produce the most elegant, high-performing doors. Our flush doors can be specified to your needs—lead-lined, bullet-resistant, acoustical, impact resistant eiDoor®, FSC certified, non-rated and fire-rated through 90-minute.

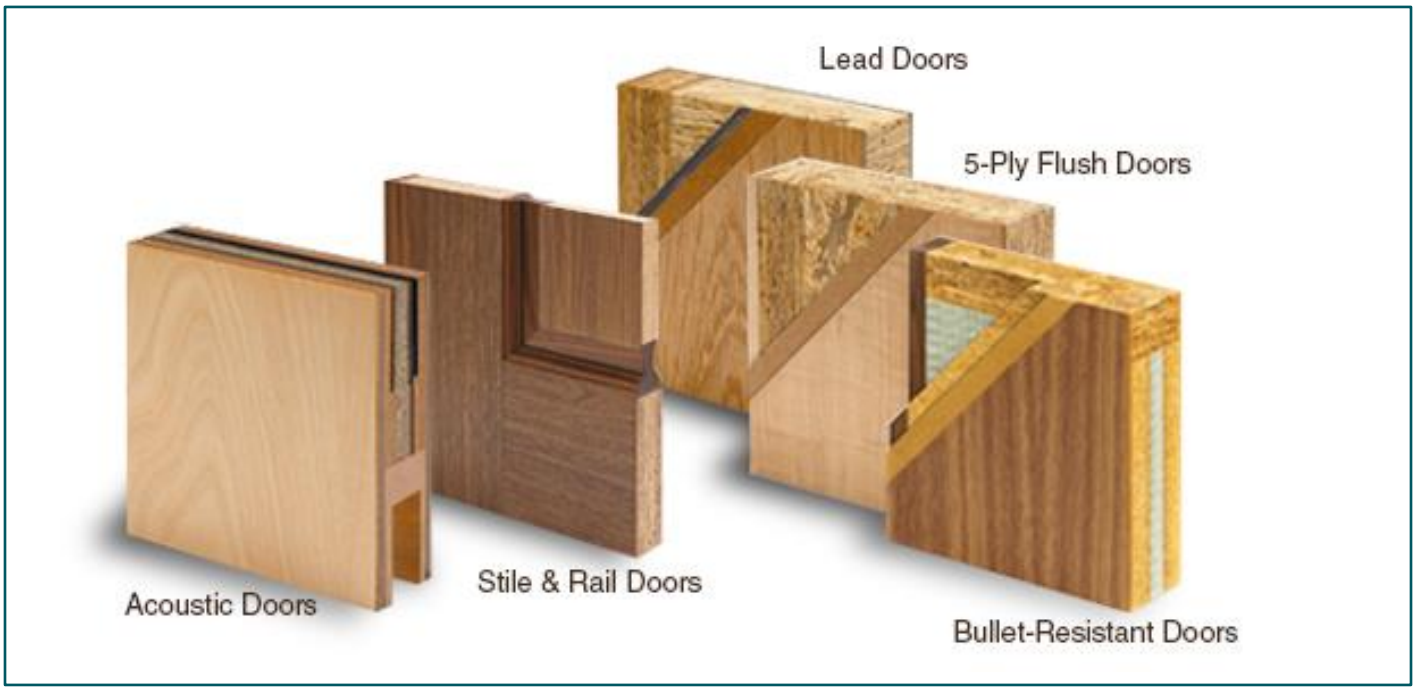
Our True Stile and Rail doors are expertly manufactured for lasting service and can be created to match a variety of custom architectural designs many of which are available up to 90-minute fire rated.

Eggers has been a Forest Stewardship Council (FSC) certified manufacturer since 2002 and we offer multiple door constructions as FSC certified.

All of our factory finished flush and stile and rail doors are certified by SCS Global Services for Indoor Advantage Gold, which is the Indoor Air Quality (IAQ) standard for building materials.The standard was developed with multi-stakeholder input and aligns with CA 01350. It qualifies for many building schemes, including LEED v4, WELL Building, and Living Building Challenge.

Product Description

This environmental product declaration (EPD) covers Eggers interior flush and stile and rail doors, which include non-rated, rated, acoustical, bullet resistant, lead-lined and impact resistant constructions. These doors are designed for installation in interior spaces. The results represent a production-weighted average door leaf.



Tables 1 and 2 show the available material construction options for Eggers flush and stile and rail doors.

Table 1: Door Construction Options – Flush

Interior Flush Doors		
Door Core Options	**Face Material Options**	**Additional Options**
Particleboard Structural Composite Lumber (SCL) Agrifiber Stave Lumber Fire-resistant Composites Acoustical	Wood Veneer Bamboo High Density Fiberboard High Impact Vinyl High Pressure Laminate Medium Density Overlay	Lead-lined Acoustical (except Acoustical core) Factory Finishing Glazing Applied Moulding

Table 2: Door Construction Options – Stile and Rail

Interior Flush Doors		
Door Core Options	**Face Material Options**	**Additional Options**
Particleboard Structural Composite Lumber (SCL) Stave Lumber Fire-resistant Composites Acoustical	Wood Veneer Bamboo High Density Fiberboard	Acoustical (except Particleboard or Acoustical cores) Factory Finishing Glazing

Industry Standards

- Architectural Woodwork Standards (AWS) Edition 2
- ANSI/WDMA I.S. 1A Industry Standard for Interior Architectural Wood Flush Doors
- ANSI/WDMA I.S. 6A Industry Standard for Interior Wood Stile and Rail Doors

Manufacturing Process

Our interior door products are manufactured using bonded core constructions and hot press technology, which meet or exceed the WDMA and AWS standards. Specified door cores are cut to size, bonded to stiles and rails and precision calibrated for thickness. High density fiberboard cross-bands and the specified door faces are adhered to the core using water based adhesives. The doors are trimmed to the specified size, beveled and machined for all applicable hardware applications. The doors are machine sanded and prefinished using water based stains and UV curable sealer and topcoats. Preparation for shipping includes individually wrapping doors in a protective polybag and stretch film wrapping the shipping load. Figure 1 illustrates the declared product system.

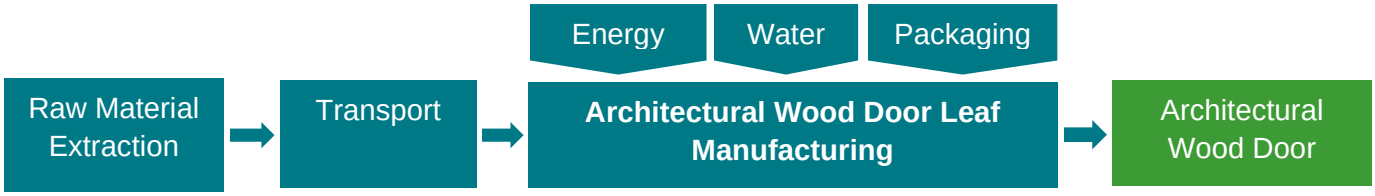


Figure 1: Cradle-to-gate product system

Material Content

This EPD covers Eggers interior flush and stile and rail doors which include non-rated, rated, acoustical, bullet resistant, lead-lined and impact resistant constructions.

Table 3: Material composition of a production-weighted average door leaf

Material	% Content by weight
Engineered Wood	80.9
Fire Resistant Composites	7.10
Wood	6.18
Adhesives	1.63
Polymers/Plastics	1.25
Glass	1.05
Stains/Coatings	0.82
Lead	0.66
Natural Fiber	0.29
Steel	0.10
Fiberglass	0.05

Life Cycle Assessment (LCA)

Declared Unit

The declared unit is a wood door leaf measuring 21 ft^2 (1.95 m^2) at a nominal thickness of 1-3/4" (44.45 mm). The mass of the corresponding reference flow is 126 lbs (57.1 kg).

System Boundaries

This EPD declares the impacts of a production-weighted average wood door leaf from cradle to gate. Therefore, post-manufacturing life cycle stages are not considered in this declaration. The applied system boundary represents the life cycle modules A1, A2, and A3 as defined by EN 15804 and shown in Figure 2.

PRODUCT STAGE			CONSTRUCTION PROCESS STAGE		USE STAGE							END OF LIFE STAGE			
Raw material supply	Transport	Manufacturing	Transport	Construction-installation process	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction demolition	Transport	Waste Processing	Disposal
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4
X	X	X	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND

Figure 2: Cradle-to-Gate or "Information Module" (The life-cycle activities and related processes shall include modules A1, A2, and A3—the product stage)

Life Cycle Impact Assessment

In accordance to the guiding PCR, TRACI 2.1 impact characterization methodology is used to calculate the declared environmental impacts. Additional inventory metrics are also calculated per the guiding PCR. The declared impacts and inventory metrics are summarized in Table 4 and represent a production-weighted average door leaf.

Table 4: LCA Results, per declared unit

Type	A1-A3	Unit
TRACI 2.1 Impact Category		
Global warming potential	111	kg CO_2 eq
Acidification potential	0.684	kg SO_2 eq
Eutrophication potential	0.030	kg N eq
Ozone depletion potential	2.03E-07	kg CFC-11 eq
Smog creation potential	8.34	kg O_3 eq
Primary Energy Consumption		
Non-renewable fossil	1458	MJ (HHV)
Non-renewable nuclear	161	MJ (HHV)
Renewable (solar, wind, hydroelectric, and geothermal)	335	MJ (HHV)
Renewable (biomass)	2.60E-10	MJ (HHV)
Material Resource Consumption		
Non-renewable material resources	130	kg
Renewable material resources	443	kg
Net fresh water (inputs minus outputs)	348	L
Waste Generation		
Non-hazardous waste generated	4.97	kg
Hazardous waste generated	0.00134	kg

Other Environmental Information

Carbon Sequestration

The guiding PCR permits separate reporting of carbon sequestered in wood components. The net Global Warming Potential credit for carbon storage is calculated using the FPInnovations PCR Carbon Sequestration Calculator, which adheres to guidance set by ISO 14047 and adopted by the International Council of Forest and Paper Associations (ICFPA).

As indicated in Table 5, 49.9 kg (87.3%) of door material content is made of wood and other renewable origins (engineered wood products, natural wood products, and natural fibers), serving as a basis for calculation. Moreover, approximately 10% of the engineered wood is considered to be resinous compounds; therefore, this mass is subtracted from the calculation (Puettmann, et al., 2013). To calculate this subtraction, the engineered wood portion was reduced by 10%. The resulting mass of 45.2 kg (79.2% of total door material content) is entered into the calculator. The wood product description nonstructural panels was found to be closest to wood door leaf. This mass is assumed to be oven dry mass. The carbon content is considered to be the default value of 50%. The output of the calculator is shown in Table 5. According to this calculator, 45.9 kg CO2-eq. are sequestered per declared unit in the product phase, A1-A3.

Table 5: FPInnovations carbon sequestration calculator results

User inputs	Unit	Description
Nonstructural panels		Choose similar product if not in list - do not enter new product name
45.2	oven dry kg	Wood mass only; no resins or moisture
50%		50% provided as default
Calculator Outputs	**Unit**	**Description**
Initial Greenhouse Gas Credit		
-82.9	**kg CO_2 eq.**	**Carbon sequestered in product at manufacturing gate**
Greenhouse Gas Emissions		
7.14	*kg CO_2*	*Carbon dioxide emissions from recycled wood (accounted as 100% CO2 emission)*
7.14	*kg CO_2*	*Carbon dioxide emissions from combusted wood waste*
5.16	*kg CO_2*	*Carbon dioxide emissions from aerobic landfills*
1.30	*kg CO_2*	*Carbon dioxide emissions from fugitive landfill gas*
6.64	*kg CO_2*	*Carbon dioxide emissions from combusted landfill gas*
27.38	**kg CO_2**	**Total carbon dioxide emissions**
0.39	*kg CH_4*	*Methane emissions from fugitive landfill gas*
0.39	**kg CH_4**	**Total methane emissions**
Net GWP Credit		
-45.9	**kg CO_2 eq.**	**Sequestration, net of greenhouse gas emissions**

Forest Stewardship Council (FSC) Certification

FSC Certified Wood

Eggers Industries has been a FSC certified secondary manufacturer since 2002. Several FSC Mix door constructions are available upon request.

Indoor Air Quality Certification

Indoor Air Quality – Low Emitting Materials

Eggers Industries doors are certified to the most transparent Indoor Air Quality (IAQ) standard for building materials SCS Global Indoor Advantage Gold which is compliant to CA 01350 test method. These test methods adhere to American Society for Testing and Materials (ASTM) Practice D5116 for small-scale chamber product testing and ASTM Practice D6670 for full-scale chamber testing. 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).

All interior flush and stile and rail door constructions are included in our SCS Indoor Advantage Gold certification.

References

ASTM 2014	ASTM, Product Category Rules (PCR) for Preparing an Environmental Product Declaration for: Interior Architectural Wood Door Leaves, 2014
GaBi ts 2016	thinkstep AG; GaBi ts: Software-System and Database for Life Cycle Engineering. Copyright, TM. Stuttgart, Echterdingen, 1992-2016.
EN 15804	EN 15804:2012-02 Sustainability of construction works - Environmental Product Declarations - Core rules for the product category of construction products
ISO 14025	ISO 14025:2011-10 Environmental labels and declarations - Type III environmental declarations - Principles and procedures
ISO 14040	ISO 14040:2009-11 Environmental management - Life cycle assessment - Principles and framework
ISO 14044	ISO 14044:2006-10 Environmental management - Life cycle assessment - Requirements and guidelines
Puetmann, et al. 2013	Puettmann, M., Oneil, E., Wilson, J., 2013. Cradle to Gate Life Cycle Assessment of U.S. Particleboard Production

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