STANLEY Access Technologies

VERIFIED by SCS Global Services ENVIRONMENTAL PRODUCT DECLARATION BASED ON LCA

Declaration Owner

Allegion Access Technologies LLC
65 Scott Swamp Rd. Farmington, CT 06032
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Product

Dura-Glide™ GreenStar Automatic Sliding Doors
(UNSPSC 30171510 – Automatic doors)

Functional Unit

1 square meter of door opening maintained and operated for 10 years.

Scope

The scope of this EPD is Cradle-to-Gate with scenarios

EPD Number and Period of Validity

SCS-EPD-09231
EPD Valid July 18, 2023 through July 17, 2028

Product Category Rule

Product Category Rule for Preparing an Environmental Product Declaration for Power-Operated Pedestrian and Revolving Doors. UNCPC 4212. ASTM International. PCRExt 2022-114, valid through August 31, 2023

Program Operator

SCS Global Services
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SCS global SERVICES

Declaration Owner:	Allegion Access Technologies LLC
Address:	65 Scott Swamp Rd. Farmington, CT 06032
Products:	Dura-Glide™ GreenStar Automatic Sliding Doors
Declaration Number:	SCS-EPD-09231
Declaration Validity Period:	EPD Valid July 18, 2023 through July 17, 2028
Program Operator:	SCS Global Services
Declaration URL Link:	https://www.scsglobalservices.com/certified-green-products-guide
LCA Practitioner:	Gerard Mansell, Ph.D., SCS Global Services
LCA Software and LCI database:	OpenLCA v1.11 software and the Ecoinvent v3.9 database
Independent critical review of the LCA and data, according to ISO 14044 and ISO 14071	☐ internal ☒ external
LCA Reviewer:	Lindita Bushi, Ph.D., Athena Sustainable Materials Institute
Product Category Rule:	Product Category Rule for Preparing an Environmental Product Declaration for Power-Operated Pedestrian and Revolving Doors. UNCPC 4212. ASTM International. PCRExt 2022-114, valid through August 31, 2023
PCR Review conducted by:	
Independent verification of the declaration and data, according to ISO 14025, ISO 21930 and the PCR	☐ internal ☒ external
EPD Verifier:	Lindita Bushi, Ph.D., Athena Sustainable Materials Institute
Declaration Contents:	ABOUT STANLEY® Access Technologies....2 PRODUCT DESCRIPTION....2 PRODUCT SPECIFICATION....3 MATERIAL RESOURCES....4 ADDITIONAL ENVIRONMENTAL INFORMATION....4 PROCESS FLOW DIAGRAM....5 LIFE CYCLE ASSESSMENT OVERVIEW....6 LIFE CYCLE IMPACT ASSESSMENT....8 ADDITIONAL ENVIRONMENTAL PARAMETERS....9 SUPPORTING TECHNICAL INFORMATION....10 REFERENCES....12

Disclaimers: *This Environmental Product Declaration (EPD) conforms to ISO 14025, 14040, 14044, and ISO 21930:2017.*

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.*

ABOUT STANLEY® Access Technologies

STANLEY® Access Technologies is committed to being an industry leader in door automation through exceptional service, high quality product innovation, and lowest total cost of ownership. For over 80 years, we have been designing, building, installing and servicing manual and automatic sliding, swinging, revolving and folding doors as well as sensors and controls.

Everywhere you go, you can find our trusted products throughout a wide variety of commercial, institutional, industrial and transportation applications.

Headquartered in Farmington, CT, STANLEY® Access Technologies is the largest manufacturer, installer and service provider of automatic doors in North America.

PRODUCT DESCRIPTION

The STANLEY Access *Dura-Glide*™ GreenStar Automatic Sliding Doors are manufactured in an ISO 9001 certified facility in Farmington, Connecticut.

The Dura-Glide GreenStar automatic durable sliding door is built on the robust Dura-Glide platform and is designed to be ECO friendly and provide energy savings through reduced air infiltration and opening time as well as self-closing swingout door leaves. The individual door leaves slide behind swingout sidelites when the mechanism is activated or can slide on the exterior when the sidelites are fixed. The door is capable of being activated from one side only or both sides of the door depending on the installation requirements. The opening/closing mechanism is all electric/electronic. The door is always equipped with safety and activation devices complying with to the applicable Codes and Standards. The Dura-Glide GreenStar is manufactured in Farmington, CT.

PRODUCT SPECIFICATION

Table 1. *Product specifications for the STANLEY DuraGlide GreenStar Automatic Sliding Doors.*

Parameter	Value	Option
Design	Single Slide or Bi-part	
Breakout	SX Panel on the 2000, SX and SO panels on the 3000	Flush/ or surface mounted panic hardware.
finish	Clear	Special Finishes Available
Typical Height	7'-8" (2.3 m), Clear Door Opening of 6'-11" (2.1 m)	Taller options available, contact your local rep
Typical Width Single Slide (narrow stiles)	7' to 9' (2.1 to 2.7 m), CDO width 35 1/4" - 47 1/4" (896 mm – 1,201 mm)	
	2000 Emergency Breakout: 39" - 51" (991 mm – 1,296 mm)	
	3000 Emergency Breakout: 75" - 99" (1,905 mm – 2,515 mm)	
Typical Width Bi-part (narrow stiles)	10' to 14' (3.0 m - 4.3 m), CDO width: 48 1/4" - 72 1/4" (1,227 mm – 1,836 mm)	
	2000 Emergency Breakout: 55 1/2" - 79 1/2" (1,411 mm – 2,021 mm)	
	3000 Emergency Breakout: 105 1/2" - 153 1/2" (2,680mm – 3,899mm)	
Header Size	8" (203 mm) High x 6" (152 mm) Deep	
Jamb Dimension	1 3/4" x 4 1/2" (44.5 mm x 114 mm)	1 3/4" x 6" (44.5 mm x 152 mm)
Stiles	Narrow 2" (51mm)	Medium 3 1/2" (89 mm)
Bottom Rail	4" (102 mm)	6" (152 mm), 8" (203 mm), 10" (254 mm), 12" (305 mm)
Typical Door Panel Weight	Up to 220 Pounds Each (100 kg)	Heavier options available
Door Panel Materials	Aluminum	
Power Required	120 VAC, 50/60 HZ, 5 Amps Minimum	Uninterrupted Power Supply
Drive System	1/4 HP DC Motor, Gear Drive, Toothed belt	Twin 1/4 HP DC Motors
Controls	Rocker Switch (with Reduced Open)	Rotary, Keyed Rotary Controls, Eco Pro, (all include Reduced Open)
Controller	Microprocessor Based, Safety Logic	
Activation Sensors	2 SU-100 Motion (Fast Tracking Enabled)	Activation sensors, Mats, Wall plates, Radio Control
Safety Sensors	1 Stan-Guard® and 2 Doorway Holding Beams	Combination sensors and mats
Locking	Key/thumb turn hook bolt	3-Point Locking, Lock Position Indicators, Electric Solenoid Lock (Fail Safe/Fail Secure), Access Control Locking with Surface or Recessed Panic Hardware, Lock Guard, Armored Strike
Security Options	Alarm contacts for remote monitoring of panel status, Security Strobes, Delayed Egress,	
Camera Options	Jamb Camera, Stan-Cam	
Temperature Rating	-30F (-34C) to 130F (55C)	
Glass Stops	1" (25.4 mm)	1/4" (6.35 mm), 1/2" (12.7 mm), 5/8" (15.9 mm)
Greenfit Sealing System	Default on for Air Infiltration. Dual Extended Concealed Sweeps, Additional Sweep Gap Fillers and Air Infiltration Blocks	
Threshold	Configurable s (Continuous for GreenFit Sealing System)	
Transom	Configurable Verticals and/or Horizontals	
Speed Range	Closing Speeds 0.5' - 1.5' per sec per ANSI. Opening Speeds 0.5' - 2.5' per sec.	
Codes and Standards	UL, cUL, ANSI/BHMA A156.10, ASTM E283 (NFRC 400), IBC, UBC, BOCA, ICBO, NFPA 101	

MATERIAL RESOURCES

The material composition and availability of raw material resources of the Dura-Glide™ GreenStar Automatic Sliding Doors are shown in Table 2. Information on product packaging is shown in Table 3.

Table 2. *Material composition of the STANLEY Access Dura-Glide™ GreenStar Automatic Sliding Doors.*

Component	Material	Availability				Dura-Glide™ GreenStar	
		Renewable	Non-Renewable	Recycled (% pre-/post-consumer)	Origin of Materials	(kg/m²)	(%)
Recycled Aluminum	Aluminum		Mineral, Abundant	30%/40%	North America	6.2	36%
Aluminum	Aluminum		Mineral, Abundant	0%	Global	7.6	45%
Steel	Steel		Mineral, Abundant	0%	Global	2.8	17%
Plastic	Plastic		Fossil, Limited	0%	Global	0.28	1.7%
Electronic Components	Steel, Plastic		Mineral, Abundant	0%	Global	$7.3x10^{-2}$	0.43%
Total						**17**	**100%**

Table 3. *Material composition of packaging for the STANLEY Access Dura-Glide™ GreenStar Automatic Sliding Doors.*

Component	Material	Availability				Dura-Glide™ GreenStar	
		Renewable	Non-Renewable	Recycled (% pre-/post-consumer)	Origin of Materials	(kg/m²)	(%)
Paper	Paper	Abundant		0%	Global	0.20	16%
Cardboard	Corrugated	Abundant		0%	Global	0.38	31%
Plastic	Plastic		Fossil, Limited	0%	Global	0.66	53%
Total						**1.24**	**100%**

In conformance with the PCR, product materials were reviewed for the presence of any toxic or hazardous chemicals with respect to US regulations[1]. Based on a review of the product components provided by the manufacturer, no regulated chemicals were identified in the product or product components.

[1] Resource Conservation and Recovery Act (RCRA), Subtitle 3. https://www.epa.gov/rcra/resource-conservation-and-recovery-act-rcra-overview

ADDITIONAL ENVIRONMENTAL INFORMATION

STANLEY® Access Technologies is the only automatic door manufacturer with two US manufacturing facilities; Indianapolis, IN and Farmington, CT.

Stanley's Refurbish Equipment Program means no dumpsters required and no landfills used; oil and grease is recycled.

Our Plant Recycling Program recycles oil and grease, cardboard, white paper and scrap aluminum and steel.

In 2017, STANLEY® Access Technologies' Farmington factory installed a combustion-free Bloom Energy Server for clean energy. This server will deliver enhanced sustainability benefits including high efficiency greenhouse gas emissions, avoid air pollutants and significantly reduce water use.

Our aluminum vendors are ISO14001 and ISO 50001 certified to control their energy usage and environmental impacts.

PROCESS FLOW DIAGRAM

The diagram below is a representation of the most significant contributions to the life cycle of the STANLEY Access Dura-Glide™ GreenStar Automatic Sliding Doors. The following life cycle stages are included: production (Modules A1-A3); construction & installation (Module A4-A5); product use (Modules B1-B7); and end-of-life (Modules C1-C4).

LIFE CYCLE ASSESSMENT OVERVIEW

The system boundary is cradle-to-gate with scenarios and includes resource extraction and processing, product manufacture and assembly, distribution/transport, use and maintenance, and end-of-life. The diagram below illustrates the life cycle stages included in this EPD.

Product			Construction Process		Use							End-of-life				Benefits and loads beyond the system boundary
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Raw material extraction and processing	Transport to manufacturer	Manufacturing	Transport	Construction - installation	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	Deconstruction demolition	Transport	Waste processing	Disposal	Reuse, recovery and/or recycling potential
X	X	X	X	X	X	MND	MND	MND	MND	X	X	X	X	X	X	MND

X = Included | MND = Module Not Declared

The following provides a brief overview of the Modules included in the product system for the STANLEY Access Dura-Glide™ GreenStar Automatic Sliding Doors.

Module A1: Raw material extraction and processing

This module includes the potential environmental impacts associated with the extraction and processing of raw materials for various component parts in the door products. The primary components are fabricated of aluminum and steel. The impacts from fabrication processes were based on representative datasets for metal product manufacturing.

Module A2: Transportation

This module includes transportation of processed raw materials and product components to the STANLEY manufacturing facilities in Connecticut and Indiana.

Module A3: Manufacture of the Door Products

This stage includes all the relevant manufacturing processes and flows, including the impacts from energy use and emissions at the facility. Production of capital goods, infrastructure, manufacturing equipment, and personnel-related activities are not included. This stage also includes the disposal (including transport) of manufacturing wastes (scrap losses).

Module A4: Transportation & Delivery to the Installation Site

This module includes the impacts associated with delivery of door product to the installation site. Transport by diesel truck an estimated distance of 3,250 km is assumed.

Module A5: Construction & Installation

This module includes installation of the products. This module includes delivery of the door products to the point of installation (downstream transportation), and installation of the products, including glazing. Impacts associated with the extraction, processing and transport of the glass are included in the installation phase. This stage also includes the disposal (including transport) of the product packaging materials. The doors are fabricated for specific door openings and applications with no installation waste.

Module B1: Normal use of the product

This module accounts for environmental impacts arising through normal anticipated use of the product. No impacts are associated with the use of the products and the results for this phase are reported as zero.

Module B2: Maintenance

Module not declared.

Module B3: Repair

Module not declared.

Module B4: Replacement

Module not declared.

Module B5: Refurbishment

Module not declared.

Module B6: Operational Energy Use

This module includes the primary energy consumption (electricity) associated with the operational use of these products. Operational energy use is estimated by the manufacturer as 121 kWh/yr based on the power rating of the product and assumed frequency of use.

Module B7: Operational Water Use

No water use occurs during the operation of the product and impacts are zero.

Module C1-C4: End-of-Life

The end-of-life stage of the product starts when it is replaced, dismantled or deconstructed from the building. There are no impacts associated with the deconstruction and dismantling processes as these are manual processes completed with hand tools and does not require any energy input for removal of the product. The impacts associated with transportation of waste materials to processing facilities, waste processing of material components and waste disposal of the product are included in these modules.

LIFE CYCLE IMPACT ASSESSMENT

Impact category indicators are calculated using the TRACI 2.1 and CML-IA characterization methods. TRACI 2.1 impact category indicators include global warming potential (100 years), acidification potential, smog potential, ozone depletion potential, and eutrophication potential. CML-IA impact category indicators include global warming potential (100 years), acidification potential, eutrophication potential, photochemical ozone creation potential, ozone depletion potential, and abiotic resource depletion (fossil fuels), in accordance with the PCR. The LCIA results are calculated using OpenLCA software. The results for these indicators are shown in Table 4.

Table 4. *Life Cycle Impact Assessment results for the STANLEY Access Dura-Glide™ GreenStar Automatic Sliding Door per functional unit. Results reported in MJ are calculated using lower heating values. All values are rounded to three significant digits.*

Impact Category	Unit	Raw Materials	Transport	Manufacturing	Construction	Use	Disposal
TRACI							
Global warming	kg CO_2 eq	185	4.05	11.7	57.9	79.2	1.05
	%	55%	1.2%	3.5%	17%	23%	0.31%
Acidification	kg N eq	1.17	4.25×10^{-2}	2.78×10^{-2}	0.422	0.441	4.10×10^{-3}
	%	56%	2.0%	1.3%	20%	21%	0.19%
Eutrophication	kg N eq	0.616	4.18×10^{-3}	2.90×10^{-2}	7.54×10^{-2}	0.223	2.59×10^{-3}
	%	65%	0.44%	3.0%	7.9%	24%	0.27%
Smog formation	kg O_3 eq	11.6	0.866	0.402	5.78	4.22	0.121
	%	51%	3.8%	1.7%	25%	18%	0.52%
Ozone depletion	kg CFC-11 eq	3.47×10^{-6}	6.98×10^{-8}	2.19×10^{-7}	8.05×10^{-7}	1.84×10^{-6}	1.41×10^{-8}
	%	54%	1.1%	3.4%	13%	29%	0.22%
Fossil fuel depletion	MJ surplus	145	7.91	25.7	87.8	122	1.63
	%	37%	2.0%	6.6%	22%	31%	0.42%
CML							
Global warming	kg CO_2 eq	187	4.08	12.0	58.3	79.8	1.08
	%	55%	1.2%	3.5%	17%	23%	0.32%
Acidification	kg SO_2 eq	1.19	3.88×10^{-2}	2.66×10^{-2}	0.412	0.457	3.25×10^{-3}
	%	56%	1.8%	1.2%	19%	21%	0.15%
Eutrophication	kg $(PO_4)^{3-}$ eq	0.310	5.67×10^{-3}	1.35×10^{-2}	5.91×10^{-2}	0.114	1.52×10^{-3}
	%	61%	1.1%	2.7%	12%	23%	0.30%
Photochemical oxidation	kg C_2H_4 eq	8.01×10^{-2}	1.25×10^{-3}	2.32×10^{-3}	1.50×10^{-2}	1.90×10^{-2}	1.74×10^{-4}
	%	68%	1.1%	2.0%	13%	16%	0.15%
Ozone layer depletion	kg CFC-11 eq	2.72×10^{-6}	5.30×10^{-8}	1.63×10^{-7}	6.02×10^{-7}	1.27×10^{-6}	1.07×10^{-8}
	%	56%	1.1%	3.4%	13%	26%	0.22%
Abiotic depletion, fossil fuels	MJ	1,810	54.9	178	627	1,040	10.9
	%	49%	1.5%	4.8%	17%	28%	0.29%

ADDITIONAL ENVIRONMENTAL PARAMETERS

ISO 21930 requires that several parameters be reported in the EPD, including resource use, waste categories and output flows, and other environmental information. The results for these parameters are shown in Table 5. As the products do not contain significant amounts of bio-based materials, biogenic carbon emissions and removals are not declared.

Table 5. *Resource use and waste flows for the automatic doors per functional unit. Results reported in MJ are calculated using lower heating values. All values are rounded to three significant digits.*

Parameter	Unit	Raw Materials	Transport	Manufacturing	Construction	Use	Disposal
Energy Resource Use							
Use of renewable primary energy excluding resources used as raw materials	MJ	519	0.622	26.5	24.5	147	5.54×10^{-2}
	%	72%	0.09%	3.7%	3.4%	20%	0.01%
Use of renewable primary energy resources used as raw materials	MJ	0.00	0.00	0.00	0.00	0.00	0.00
	%	0%	0%	0%	0%	0%	0%
Use of non renewable primary energy excluding resources used as raw materials	MJ	INA	INA	INA	INA	INA	INA
Use of non renewable primary energy resources used as raw materials	MJ	INA	INA	INA	INA	INA	INA
Use of secondary materials	kg	5.32	0.00	0.00	0.00	0.00	0.00
	%	100%	0.00%	0.00%	0.00%	0.00%	0.00%
Use of secondary fuels	MJ	N/A	N/A	N/A	N/A	N/A	N/A
Recovered energy	MJ	N/A	N/A	N/A	N/A	N/A	N/A
Use of net fresh water	m^3	7.05	3.71×10^{-2}	0.531	1.08	7.76	4.67×10^{-3}
	%	43%	0.23%	3.2%	6.5%	47%	0.03%
Wastes							
Hazardous waste disposed	kg	1.04×10^{-2}	3.37×10^{-4}	5.87×10^{-4}	3.15×10^{-3}	3.61×10^{-3}	7.25×10^{-5}
	%	57%	1.9%	3.2%	17%	20%	0.40%
Non-hazardous waste disposed	kg	42.8	2.00	2.24	12.1	10.3	5.49
	%	57%	2.7%	3.0%	16%	14%	7.3%
High-level radioactive wastes disposed	kg	4.57×10^{-4}	2.90×10^{-6}	8.51×10^{-5}	6.34×10^{-5}	1.24×10^{-3}	2.90×10^{-7}
	%	25%	0.16%	4.6%	3.4%	67%	0.02%
Low-level radioactive wastes disposed	kg	1.14×10^{-3}	6.93×10^{-6}	4.06×10^{-4}	1.46×10^{-4}	6.32×10^{-3}	6.97×10^{-7}
	%	14%	0.09%	5.1%	1.8%	79%	0.01%
Components for Re-use	kg	0.00	0.00	0.00	0.00	0.00	0.00
Materials for Recycling	kg	0.00	0.00	0.00	0.536	0.00	10.1
	%	0.00%	0.00%	0.00%	5.0%	0.00%	95%
Materials for energy recovery	kg	N/A	N/A	N/A	N/A	N/A	N/A
Exported energy	MJ	N/A	N/A	N/A	N/A	N/A	N/A

INA = Indicator not assessed. No classification scheme is available in OpenLCA to estimate these indicators.

SUPPORTING TECHNICAL INFORMATION

Data Sources

Component	Material Dataset	Processing Dataset	Data Source	Publication Date
PRODUCT COMPONENT				
Recycled Aluminum	market for aluminium, primary, ingot | aluminium, primary, ingot | Cutoff, S/IAI Area, NA	metal working, average for aluminium product manufacturing | metal working, average for aluminium product manufacturing | Cutoff, S/RoW	EI v3.9	2022
	market for aluminium scrap, new | aluminium scrap, new | Cutoff, S/RoW		EI v3.9	2022
	market for aluminium scrap, post-consumer | aluminium scrap, post-consumer | Cutoff, S/GLO		EI v3.9	2022
Aluminum	market for aluminium, primary, ingot | aluminium, primary, ingot | Cutoff, S/IAI Area, North America	metal working, average for aluminium product manufacturing | metal working, average for aluminium product manufacturing | Cutoff, S/RoW	EI v3.9	2022
Steel	steel production, converter, low-alloyed | steel, low-alloyed | Cutoff, S/RoW	metal working, average for steel product manufacturing | metal working, average for steel product manufacturing | Cutoff, S/RoW	EI v3.9	2022
Plastic	polyethylene production, high density, granulate | polyethylene, high density, granulate | Cutoff, S/RoW	injection moulding | injection moulding | Cutoff, S/RoW	EI v3.9	2022
	polyvinylchloride production, bulk polymerisation | polyvinylchloride, bulk polymerised | Cutoff, S/RER		EI v3.9	2022
	acrylonitrile-butadiene-styrene copolymer production | acrylonitrile-butadiene-styrene copolymer | Cutoff, S/RER		EI v3.9	2022
	Polyoxymethylene (POM) PlasticsEurope/EU-27		EI v3.9	2022
	polyurethane production, rigid foam | polyurethane, rigid foam | Cutoff, S/RoW		EI v3.9	2022
	polyvinylchloride production, bulk polymerisation | polyvinylchloride, bulk polymerised | Cutoff, S/RoW		EI v3.9	2022
	synthetic rubber production | synthetic rubber | Cutoff, S/RoW		EI v3.9	2022
	nylon 6-6 production | nylon 6-6 | Cutoff, S/RoW		EI v3.9	2022
Electronics/ Motor Assembly	Electronics, for control units {GLO}| market for | Alloc Rec (46% steel (housing), 32% plastics, 14% printed wiring boards and 8% cables)	Included with material dataset	EI v3.9	2022
Glass	flat glass production, uncoated | flat glass, uncoated | Cutoff, S/RoW	tempering, flat glass | tempering, flat glass | Cutoff, S/RoW	EI v3.9	2022
PACKAGING				
Cardboard	containerboard production, linerboard, kraftliner | containerboard, linerboard | Cutoff, S/RoW	Included with material dataset	EI v3.9	2022
Plastic Wrap	packaging film production, low density polyethylene | packaging film, low density polyethylene | Cutoff, S/RoW	Included with material dataset	EI v3.9	2022
Paper	kraft paper production | kraft paper | Cutoff, S/RoW	Included with material dataset	EI v3.9	2022
TRANSPORTATION				
Road transport	Diesel Truck	transport, freight, lorry 16-32 metric ton, EURO4 | transport, freight, lorry 16-32 metric ton, EURO4 | Cutoff, S/RoW	EI v3.9	2022
Ship transport	Transoceanic Ship	transport, freight, sea, container ship | transport, freight, sea, container ship | Cutoff, S/GLO	EI v3.9	2022
RESOURCES				
Electricity	RFCW eGRID sub-region electricity grid	Electricity, medium voltage, at grid/RFCW	EI v3.9;eGRID	2022; 2020
Electricity	NEWE eGRID sub-region electricity grid	Electricity, medium voltage, at grid/NEWE	EI v3.9;eGRID	2022; 2020
Electricity	US average electricity grid	Electricity, medium voltage, {US} | market for | Allo	EI v3.9	2022
Natural gas combustion	Natural gas	heat production, natural gas, at boiler modulating >100kW | heat, district or industrial, natural gas | Cutoff, S/RoW	EI v3.9	2022

Data Quality

Data Quality Parameter	Data Quality Discussion
Time-Related Coverage Age of data and the minimum length of time over which data should be 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 10 years old. All of 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 2021.
Geographical Coverage Geographical area from which data for unit processes should be collected to satisfy the goal of the study	The data used in the analysis provide the best possible representation available with current data. Electricity use for product manufacture is modeled using representative data for the appropriate eGRID electricity grid mixes. Surrogate data used in the assessment are representative of North American or global operations. Data representative of global operations are considered sufficiently similar to actual processes. Data representing product disposal are based on US statistics.
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 datasets are used to represent the actual processes, as appropriate.
Precision Measure of the variability of the data values for each data expressed (e.g. variance)	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 or estimated	The LCA model included all known mass and energy flows for production of the door products. In some instances, surrogate data used to represent upstream and downstream 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. In total, these missing data represent less than 5% of the mass or energy flows.
Representativeness Qualitative assessment of the degree to which the data set reflects the true population of interest (i.e. geographical coverage, time period, and technology coverage)	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 to the 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 v3.9 data where available. Different portions of the product life cycle are equally considered; however, it must be noted that final disposition of the product is based on assumptions of current average practices in the United States.
Reproducibility Qualitative assessment of the extent to which information about the methodology and data values would allow an independent practitioner to reproduce the results 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 STANLEY manufacturing facilities represent 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 v3.9 LCI data are used.

Allocation

Annual energy resource use and emissions at the STANLEY manufacturing facilities were reported separately for electricity and fuel consumption (natural gas) and allocated to the product based on the cost of production of the product as a fraction of the total facility production costs (i.e., economic allocation).
The product system includes some recycled materials, which were allocated using the recycled content allocation method (also known as the 100-0 cut off method). Using the recycled content allocation approach, system inputs with recycled content do not receive any burden from the previous life cycle other than reprocessing of the waste material. At end of life, materials which are recycled leave the system boundaries with no additional burden.

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

Cut-off criteria

According to the PCR, cumulative omitted mass or energy flows within the product boundary shall not exceed 1%. In the present study, except as noted, all known materials and processes were included in the life cycle inventory.

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