Environmental Product Declaration | Clarus | Adapt & Float

Declaration Owner

Clarus
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Product

Adapt glassboards
Float glassboards

Functional Unit

1 unit of glassboard, used and maintained for 10 years

EPD Number and Period of Validity

SCS-EPD-10120
EPD Valid May 2, 2024 through May 1, 2029

Product Category Rule

ISO 21930:2017 - Sustainability in buildings and civil engineering works — Core rules for environmental product declarations of construction products and services

Program Operator

SCS Global Services
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Declaration Owner:	Clarus
Address:	7537 Jack Newell Blvd N, Fort Worth, TX 76118
Declaration Number:	SCS-EPD-10120
Declaration Validity Period:	EPD Valid May 2, 2024 through May 1, 2029
Program Operator:	SCS Global Services
Declaration URL Link:	https://www.scsglobalservices.com/certified-green-products-guide
LCA Practitioner:	Urvi Talaty, SCS Global Services
LCA Software and LCI database:	OpenLCA v1.11 software and the Ecoinvent v3.9 database
Product RSL:	10 years
Markets of Applicability:	North America
EPD Type:	Product-Specific
EPD Scope:	Cradle-to-Grave
LCIA Method and Version:	TRACI 2.1; CML-IA
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:	ISO 21930:2017. Sustainability in buildings and civil engineering works — Core rules for environmental product declarations of construction products and services.
PCR Review conducted by:	ISO Technical Committee
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:	1. Clarus ... 2 2. Product ... 2 3. LCA: Calculation Rules ... 7 4. LCA: Scenarios and Additional Technical Information ... 12 5. LCA: Results ... 14 6. LCA: Interpretation ... 19 7. References ... 23

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

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.*

In accordance with ISO 21930:2017, EPDs are comparable only if they comply with the core PCR, use the same sub-category PCR where applicable, include all relevant information modules and are based on equivalent scenarios with respect to the context of construction works.

1. Clarus

Clarus is the pioneer and innovator of the glassboard. As the world's largest glassboard manufacturer, Clarus' modern and minimalist dry-erase solutions have literally and visually transformed strategic, interpersonal communication. Established in 2009, Clarus has experienced explosive growth, requiring the company to relocate to larger facilities 5 times in 9 years. The Clarus design team invents new ways to use the most basic form of written communication in the most modern ways. Clarus leads the Architecture and Design industry by working with the most prestigious brands across the globe and inspiring collaboration in corporate, government, healthcare, and educational settings.

2. Product

2.1 PRODUCT DESCRIPTION

Adapt

The Clarus Design Team engineered glassboards to directly attach to the bestselling workstations on the market. Adapt panels are customized to each individual furniture system, and panels can be painted in 150+ colors and attached using existing hardware within the workstation. As a simple upgrade or a high design element for a new, fresh office, Adapt allows employees to easily brainstorm, jot notes, communicate, and collaborate without ever leaving the workstation.

Float

Float is a magnetic, backpainted glassboard that mounts flush on the wall with minimal, invisible mounting hardware on the back of the board. As the most premier writing surface in the furniture industry, Float can be completely customized by color, size, and shape, along with additional options of frames.

2.2 PRODUCT FLOW DIAGRAM

The diagram below is a representation of the most significant contributions to the life cycle of Adapt and Float glassboards.

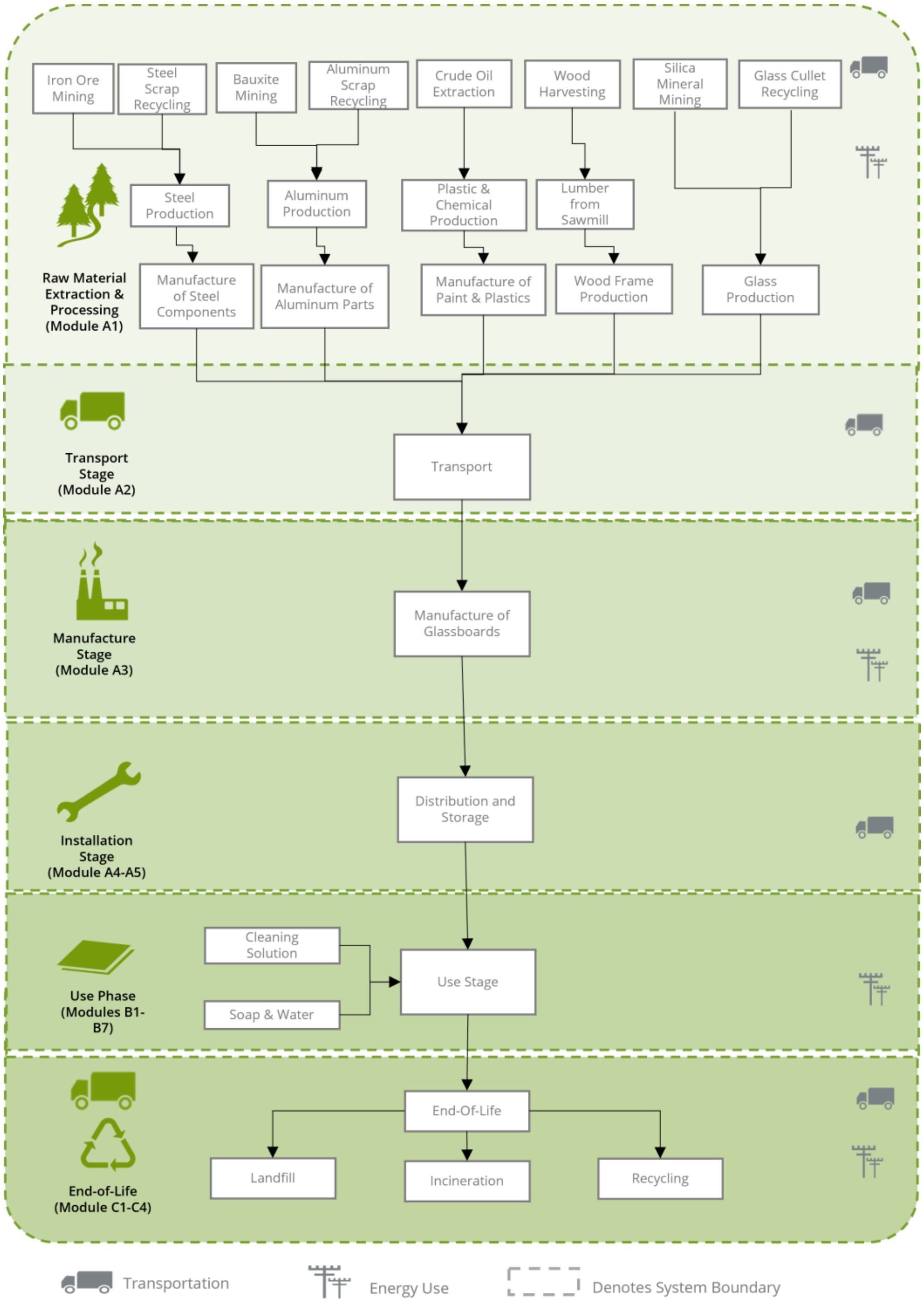

Figure 1. *Flow Diagram representing the major unit operations in the life cycle of Clarus Adapt and Float Glassboard product systems.*

2.3 APPLICATION

The Clarus products serve the function of a typical office writing board. The products are used in a variety of office settings.

2.4 DECLARATION OF METHODOLOGICAL FRAMEWORK

The scope of the EPD is cradle-to-grave, including raw material extraction and processing, transportation, product manufacture, product delivery, installation and use, and product disposal. The life cycle phases included in the product system boundary are shown below.

Cut-off and allocation procedures are described below and conform to the PCR and ISO standards.

Table 1. *Life cycle phases included in the product system boundary.*
X = included

Product			Construction Process		Use							End-of-life			
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4
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
x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x

2.5 TECHNICAL DATA

Specifications for the Clarus products are summarized in Table 2.

Table 2. *Product and packaging weights for the Clarus products.*

Product name	Reference Flow - Product (kg)	Reference Flow - Packaging (kg)
Adapt - Magnetic	46.7	28.2
Float - Wood Frame, Magnetic	34.5	27.3
Float - Wood Frame, Non-magnetic	30.4	27.3
Float - Aluminum Frame, Magnetic	36.8	27.3
Float - Aluminum Frame, Non-magnetic	32.7	27.3

2.6 MARKET PLACEMENT/APPLICATION RULES

Distribution of the products to consumer markets is included in the model, based on data from the manufacturer.

2.7 PROPERTIES OF DECLARED PRODUCT AS DELIVERED

The products are delivered assembled and wrapped in plastic foam pads, and wooden crates.

2.8 MATERIAL COMPOSITION

Clarus Glassboard products are constructed from a variety of materials including glass, fabricated steel and aluminum parts, wood and various coatings, plastics, and adhesives. Table 3 and Table 4 summarize the components by mass for each product model, including packaging. The product component materials as a percentage of the total mass are also presented.

Table 3. *Component material summary for the Adapt Clarus glassboard products by mass (kg per unit) and as a percentage of total mass. (Models: Adapt-Magnetic)*

Component/Material	*Adapt-Magnetic*
Glass	34.8
	74%
Steel	11.8
	25%
Plastic	0.001
	0.02%
Paint	0.154
	0.33%
Product Total	***46.8***
	100%

Table 4. *Component material summary for the Clarus Float glassboard products by mass (kg per unit) and as a percentage of total mass. (Models: Float-Wood Frame, Magnetic; Float-Wood Frame, Non-magnetic; Float-Aluminum Frame, Magnetic; Float-Aluminum Frame)*

Component/Material	*Float-Wood, Magnetic*	*Float-Wood, Non-magnetic*	*Float-Aluminum, Magnetic*	*Float-Aluminum, Non-magnetic*
Glass	17.4	17.4	17.4	17.4
	50%	57%	47%	53%
Steel	4.08	0	4.54	0.454
	12%	-	12%	1%
Wood	7.39	7.39	0	0
	21%	24%	-	-
Aluminum	5.44	5.44	14.6	14.6
	16%	18%	40%	45%
Glue	0.009	0	0.009	0
	0.03%	-	0.02%	-
Paint	0.132	0.113	0.136	0.122
	0.38%	0.37%	0.37%	0.37%
Plastic	0.045	0.045	0.045	0.045
	0.13%	0.15%	0.12%	0.14%
Product Total	***34.5***	***30.4***	***36.8***	***32.7***
	100%	***100%***	***100%***	***100%***

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

2.9 MANUFACTURING

The products are manufactured at Clarus' manufacturing facility in Texas. The manufacturer provided primary data for their annual production, resource use and electricity consumption and waste generation at the facility. The electricity supply mix for the facility is modeled as the ERCT eGRID subregional power grid.

2.10 PACKAGING

The products are packaged for shipment using wooden crates, foam pads, and plastic wrap.

Table 5. *Packaging summary for the Adapt Clarus glassboard products by mass (kg per unit) and as a percentage of total mass. (Model: Adapt-Magnetic)*

Component/Material	*Adapt-Magnetic*
Lumber	28.1
	99.6%
Stretch Wrap	0.0907
	0.32%
Foam Pads	0.0181
	0.06%
Packaging Total	***28.2***
	100%

Table 6. *Component material summary for the Clarus Float glassboard products by mass (kg per unit) and as a percentage of total mass. (Models: Float-Wood Frame, Magnetic; Float-Wood Frame, Non-magnetic; Float-Aluminum Frame, Magnetic; Float-Aluminum Frame)*

Component/Material	*Float-Wood, Magnetic*	*Float-Wood, Non-magnetic*	*Float-Aluminum, Magnetic*	*Float-Aluminum, Non-magnetic*
Lumber	27.2	27.2	27.2	27.2
	99.6%	99.6%	99.6%	99.6%
Stretch Wrap	0.091	0.091	0.091	0.091
	0.3%	0.3%	0.3%	0.3%
Foam Pads	0.018	0.018	0.018	0.018
	0.1%	0.1%	0.1%	0.1%
Packaging Total	***27.3***	***27.3***	***27.3***	***27.3***
	100%	***100%***	***100%***	***100%***

2.11 PRODUCT INSTALLATION

The products are installed using hand tools with no associated emissions or impacts. Impacts associated with the disposal of packaging materials are included in the installation life cycle phase (A5).

2.12 USE CONDITIONS

No special conditions of use are noted.

2.13 REFERENCE SERVICE LIFE

The Reference Service Life (RSL) of the products is 10 years.

2.14 RE-USE PHASE

There are no components of the product which can be reused at the end of the reference service lifetime and this parameter is reported as zero.

2.15 DISPOSAL

No specific data were available to estimate the final disposition of the product and packaging at end-of-life. Disposal statistics, including recycling rates for durable goods and packaging were used as a proxy, taken from the EPA disposal statistics data for the US.

2.16 FURTHER INFORMATION

Further information on the product can be found on the manufacturer's website https://www.clarus.com/green/

3. LCA: Calculation Rules

3.1 FUNCTIONAL UNIT

The Clarus glassboard products are a general-purpose office writing surface of varying sizes and configurations. The glassboards provide the primary function of a writing surface and are constructed of glass, extruded steel and aluminum and miscellaneous plastics, wood, adhesives and steel hardware. According to ISO 14044, the functional unit is "the quantified performance of a product system, for use as a reference unit." The functional unit used in the study, consistent with the PCR, is one unit of glassboard, serving the function of a typical office writing surface and used and maintained for 10 years. The reference unit used in the study is one complete glassboard product, including packaging. The reference flow and product mass for each model assessed are summarized below.

Table 7. *Reference flow and RSL for the table products.*

Product	Reference Flow – Product (kg)	Reference Flow - Packaging (kg)	Reference Service Life – RSL (years)
Adapt - Magnetic	46.7	28.2	10
Float - Wood Frame, Magnetic	34.5	27.3	
Float - Wood Frame, Non-magnetic	30.4	27.3	
Float - Aluminum Frame, Magnetic	36.8	27.3	
Float - Aluminum Frame, Non-magnetic	32.7	27.3	

3.2 SYSTEM BOUNDARY

The scope of the EPD is cradle-to-grave, including raw material extraction and processing, transportation, product manufacture, product delivery, installation and use, and product disposal. The life cycle phases included in the EPD scope are described in Table 8.

Table 8. *The modules and unit processes included in the scope for the Clarus products.*

Module	Module Description	Unit Processes Included in Scope
A1	Extraction and processing of raw materials; any reuse of products or materials from previous product systems; processing of secondary materials; generation of electricity from primary energy resources; energy, or other, recovery processes from secondary fuels	Extraction and processing of raw materials for the product and packaging components.
A2	Transport (to the manufacturer)	Transport of component materials to the manufacturing facility
A3	Manufacturing, including ancillary material production	Manufacturing of the products and packaging (including upstream unit processes*)
A4	Transport (to the building site)	Transport of product (including packaging) to the building site
A5	Construction-installation process	The products are installed using hand tools with no associated emissions or impacts. No specific maintenance of the product is identified by the manufacturer. Only impacts from packaging disposal are included in this phase.
B1	Product use	Use of the product in a commercial building setting. There are no associated emissions or impacts from the use of the product
B2	Product maintenance	Maintenance of products over the 10 year ESL, including periodic cleaning.
B3	Product repair	The product is not expected to require repair over its lifetime
B4	Product replacement	The product is not expected to require replacement over its lifetime
B5	Product refurbishment	The product is not expected to require refurbishment over its lifetime
B6	Operational energy use by technical building systems	There is no operational energy use associated with the use of the product
B7	Operational water uses by technical building systems	There is no operational water use associated with the use of the product
C1	Deconstruction, demolition	Removal of the product is accomplished using hand tools with no associated emissions and negligible impacts
C2	Transport (to waste processing)	Transport of the product to waste treatment at end-of-life
C3	Waste processing for reuse, recovery and/or recycling	The products are disposed of via landfilling or incineration which requires no waste processing
C4	Disposal	Disposal of the product

**This includes unit processes involved in the generation of electricity, and production of material input (e.g., adhesives and pigments).*

3.3 PRODUCT SPECIFIC CALCULATION FOR USE PHASE

Maintenance of the glassboards (B2) was limited to monthly cleaning, over the assumed 10 year lifetime. A 1-liter dilution of mild detergent (1 part detergent to 30 parts water) was assumed to be applied monthly to the glassboard. Impacts related to indoor air quality during the product use phase are also excluded. No product replacements are required over the 10 year ESL.

3.4 UNITS

All data and results are presented using SI units.

3.5 ESTIMATES AND ASSUMPTIONS

The assessment relied on a number of assumptions related to material composition, processing, and use and maintenance. The major assumptions used in the assessment are described below.

- Electricity and resource use (natural gas, fuel oil) at the Clarus facilities were allocated to the product based on the product mass as a fraction of the total facility production volume.
- The Clarus Ft. Worth, Texas facility is located in the ERCT eGRID ERCT subregion. An Ecoinvent v3.9.1 inventory dataset was modified to reflect the eGRID energy mix for the ERCT region to estimate resource use and emissions from electricity use at the Clarus manufacturing facility.
- Data for the manufacturing processes to produce many of the steel, aluminum and plastic components of the products were not specifically known. Therefore, average metal working and plastic injection molding datasets for steel, aluminum and plastic component manufacturing are used.
- Modeling of recycled material follows the recycled content method (also known as 100-0 method or cut-off method) whereby only the burdens of reprocessing the waste material are allocated to the system from the use of the recycled material.
- The glassboard products include powder-coated aluminum and steel which were modeled using Ecoinvent LCI datasets based on the coated surface area. Lacking specific data for the coated surface area, a conservative estimate was used based on the general dimensions of the frame and other coated components.
- For the product end-of-life, recycling rates (Section 2.14) are assumed based on the 2018 US Environmental Protection Agency (EPA) Municipal Solid Waste (MSW) reports. Materials not recycled are assumed to go to a municipal landfill (80%) and incineration (20%) based on information from the MSW reports. These data supply recycling rates for durable goods, as well as for packaging and containers.
- For final disposal of the packaging material and product at end-of-life, all materials are assumed to be transported 32 km by diesel truck to either a landfill, incineration facility, or material reclamation facility (for recycling). Datasets representing disposal in a landfill and waste incineration are from Ecoinvent.
- The use phase of the product life cycle was modeled based on information provided by the manufacturer including recommended installation and cleaning methods. A monthly cleaning frequency was assumed for the assessment.
- An analysis of impacts to indoor air quality during use of the product was considered outside the scope and was not included.

3.6 CUT-OFF RULES

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.

3.7 DATA SOURCES

Primary data were provided for the manufacturing facility. The sources of secondary LCI data are the Ecoinvent database.

Table 9. *LCI datasets and associated databases used to model material production and processing for the Clarus products.*

Component	Dataset	Data Source	Publication Date
PRODUCT			
Glass			
Glass	market for flat glass, uncoated | flat glass, uncoated | Cutoff, U - RoW	EI v3.9.1	2022
	N/A	Supplier EPD	2023
Steel			
Steel	market for steel, low-alloyed | steel, low-alloyed | Cutoff, U	EI v3.9.1	2022
Steel fabrication	market for metal working, average for steel product manufacturing | metal working, average for steel product manufacturing | Cutoff, U	EI v3.9.1	2022
Powder coat	market for powder coat, steel | powder coat, steel | Cutoff, U - GLO	EI v3.9.1	2022
Plastics			
Polyethylene, nylon, polyurethane, acrylic	market for polyethylene, high density, granulate | polyethylene, high density, granulate | Cutoff, U - GLO	EI v3.9.1	2022
	market for nylon 6 | nylon 6 | Cutoff, U - RoW	EI v3.9.1	2022
	market for polyurethane, flexible foam | polyurethane, flexible foam | Cutoff, U - RoW	EI v3.9.1	2022
	market for acrylic binder, with water, in 54% solution state | acrylic binder, with water, in 54% solution state | Cutoff, U - RoW	EI v3.9.1	2022
	market for injection moulding | injection moulding | Cutoff, U - GLO	EI v3.9.1	2022
Aluminum			
Recycled Aluminum	market for aluminium, primary, ingot | aluminium, primary, ingot | Cutoff, U - IAI Area, North America	EI v3.9.1	2022
Aluminum fabrication	market for metal working, average for aluminium product manufacturing | metal working, average for aluminium product manufacturing | Cutoff, U - GLO	EI v3.9.1	2022
Powder coat	market for powder coat, aluminium sheet | powder coat, aluminium sheet | Cutoff, U - GLO	EI v3.9.1	2022
Wood			
Wood	market for sawnwood, board, hardwood, dried (u=10%), planed | sawnwood, board, hardwood, dried (u=10%), planed | Cutoff, U - RoW	EI v3.9.1	2022
PACKAGING			
Stretch wrap	market for packaging film, low density polyethylene | packaging film, low density polyethylene | Cutoff, U - GLO	EI v3.9.1	2022
Pallet	market for EUR-flat pallet | EUR-flat pallet | Cutoff, U - RoW	EI v3.9.1	2022
Foam pads	market for polyurethane, flexible foam | polyurethane, flexible foam | Cutoff, U - RoW	EI v3.9.1	2022
TRANSPORT			
Road transport	market for transport, freight, lorry 16-32 metric ton, EURO4 | transport, freight, lorry 16-32 metric ton, EURO4 | Cutoff, U - RoW	EI v3.9.1	2022
Ship transport	market for transport, freight, sea, container ship | transport, freight, sea, container ship | Cutoff, U - GLO	EI v3.9.1	2022
RESOURCES			
Grid electricity	market for electricity, medium voltage | electricity, medium voltage | Cutoff, U -Custom ERCT 2021	EI v3.9.1	2022
Heat – natural gas	market for heat, district or industrial, natural gas | heat, district or industrial, natural gas | Cutoff, U - RoW	EI v3.9.1	2022
Fuel - Propane	market for propane | propane | Cutoff, U - GLO	EI v3.9.1	2022
Water	market for tap water | tap water | Cutoff, U - RoW	EI v3.9.1	2022

3.8 DATA QUALITY

The data quality assessment addresses the following parameters: time-related coverage, geographical coverage, technological coverage, precision, completeness, representativeness, consistency, reproducibility, sources of data, and uncertainty.

Table 10. *Data quality assessment for the product system.*

Data Quality Parameter	Data Quality Discussion
Time-Related Coverage: Age of data and the minimum length of time 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 10 years old. All of the secondary 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 2022.
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. Electricity use for product manufacture is modeled using representative data for ERCT subregion in the US. Surrogate data used in the assessment are representative of European or global operations. Data representative of global operations are 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	Precision of results are not quantified due to a lack of data. Secondary data for operations are 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 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	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 v3.9.1 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 waste disposal statistics for the US.
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 Clarus' Texas facility represent an annual average and are considered of medium to high quality due to the length of time over which these data are collected for the existing production processes. For secondary LCI datasets, Ecoinvent v3.9.1 LCI data are used. For flat glass, LCI and LCI results from the supplier are used.
Uncertainty of the Information: Uncertainty related to data, models, and assumptions	Uncertainty related to materials in the products and packaging is low. Actual supplier data for upstream operations was not available 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.

3.9 PERIOD UNDER REVIEW

The period of review is calendar year 2022.

3.10 ALLOCATION

The study followed the allocation guidelines of ISO 14044 and sought to minimize the use of allocation where possible. The PCR establishes a preference for allocation following mass or other biophysical relationships. Resource use (e.g., water and energy), emissions and waste at the manufacturing facility are allocated based on the mass of the product as a fraction of the total facility production volume. An alternative economic-based allocation approach is investigated through a sensitivity analysis. Impacts from transportation were allocated based on the mass of material and distance transported.

3.11 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.

4. LCA: Scenarios and Additional Technical Information

Transportation and Distribution

Transportation for the LCA model is based on data from the component manufacturer (1st tier supplier) to the Ft. Worth, TX facility for fabrication and assembly. Transportation data for 2nd tier suppliers (material supplier to component manufacturer) are based on data embedded in the representative LCI datasets.

Distribution of the products to point of sale is included in the model, based on data from the manufacturer. According to the manufacturer, the average transportation distance to point of sale is approximately 1,085 miles via diesel truck. Transportation for end-of-life scenarios was modeled using the EPA WARM model assumption of 20 miles, from the point of product use to a landfill, material recovery center, or waste incinerator.

Installation of the product is accomplished using hand tools with no associated emissions and negligible impacts. The impacts associated with packaging disposal are included with the installation phase as per PCR requirements.

Table 11. *Installation parameters for the products.*

Parameter	Value for Adapt	Value for Float
Ancillary materials	-	-
Net freshwater consumption (m^3)	-	-
Electricity consumption (kWh)	-	-
Product loss per functional unit (kg)	negligible	negligible
Waste materials generated by product installation (kg)	negligible	negligible
Output materials resulting from on-site waste processing (kg)	n/a	n/a
Direct emissions (kg)	-	-
Mass of packaging waste (kg)		
Plastic	0.109	0.109
Wood	28.2	27.3
Biogenic carbon in packaging (kg C)	14.1	13.7
VOC emissions	negligible	negligible

Use stage (B1)

No impacts are associated with the use of the product over the Reference Service Lifetime.

Maintenance stage (B2)

Maintenance of the glassboards (B2) was limited to monthly cleaning, over the assumed 10 year lifetime. A 1-liter dilution of mild detergent (1 part detergent to 30 parts water) was assumed to be applied monthly to the glassboard.

Repair/Refurbishment stage (B3; B5)

Product repair and refurbishment are not relevant during the lifetime of the product.

Replacement stage (B4)

No product replacements are required on the 10-year lifetime of the product.

Building operation stage (B6 – B7)

There is no operational energy or water use associated with the use of the product.

Disposal stage (C1 - C4)

No specific data are available regarding the recycling rate of materials of the Clarus products at end-of-life. Assumptions for end-of-life are based on 2018 statistics regarding municipal solid waste generation and disposal in the United States, from the US Environmental Protection Agency. This data supplies waste management rates for durable goods, including appliances, furniture, furnishings, electronic equipment, business equipment, and other products. Data is also available for recycling rates of containers and packaging. The relevant recycling, incineration and landfill rates applied to the assessment are described in Table 12.

Table 12. *Recycling rates for packaging materials at end-of-life.*

Parameter	Recycling (%)	Combustion (%)	Landfill (%)
DURABLE GOODS			
Steel	27.8%	13%	59.2%
Glass	-	13.4%	86.6%
Wood	-	18.1%	81.9%
Aluminum	-	15.4%	84.6%
Plastic	6.8%	12.7%	80.5%
CONTAINERS AND PACKAGING			
Wood	26.9%	14.3%	58.8%
Plastic	13.6%	16.9%	69.5%
Other	-	20%	80%

Transportation for end-of-life scenarios was modeled using the EPA WARM model assumption of 20 miles, from the point of product use to a landfill, material recovery center, or waste incinerator.

5. LCA: Results

Results of the Life Cycle Assessment are presented below. It is noted that LCA results are relative expressions and do not predict impacts on category endpoints, the exceeding of thresholds, safety margins or risks. All LCA results are stated to three significant figures in agreement with the PCR for this product and therefore the sum of the total values may not exactly equal 100%.

Table 13 summarizes the nomenclature and reporting units for the additional inventory parameters (energy and waste flows), as specified in the PCR, while Tables 14-18 present these results according to the life cycle module definitions for the five Clarus products. Category indicator results for the product are summarized by life cycle phase in Tables 19-23.

Modules B1, B3, B4, B5, B6, and B7 are not associated with any impact and are therefore declared as zero. In addition, module C1 and C3 are likewise not associated with any impact as the products are expected to be manually deconstructed. In the interest of space and table readability, these modules are not included in the results presented below.

Table 13. *Nomenclature and reporting units for resource use and waste flows.*

Parameter	Units
RESOURCES	
Renewable primary resources used as energy carrier (RPR_E)	MJ, LHV
Renewable primary resources used as material (RPR_M)	MJ, LHV
Non-renewable primary resources used as an energy carrier ($NRPR_E$)	MJ, LHV
Non-renewable primary resources used as material ($NRPR_M$)	MJ, LHV
Secondary materials (SM)	MJ, LHV
Renewable secondary fuels (RSF)	MJ, LHV
Non-renewable secondary fuels (NRSF)	MJ, LHV
Recovered energy (RE)	MJ, LHV
Use of net freshwater resources (FW)	m^3
WASTES	
Non-hazardous waste disposed (NHWD)	kg
Hazardous waste disposed (NWD)	kg
High-level radioactive waste (HLRW)	kg
Intermediate- and low-level radioactive waste (ILLRW)	kg
Components for re-use (CRU)	kg
Materials for recycling (MR)	kg
Materials for energy recovery (MER)	kg
Recovered energy exported from the product system (EE)	MJ

Table 14. *Resource use and waste flows for Adapt Magnetic over a 10 year time horizon. Results reported in MJ are calculated using lower heating values. All values are rounded to three significant digits.*
Neg. = Negligible

Impact Category	Unit	Raw Materials (A1)	Upstream Transport (A2)	Manufacturing (A3)	Downstream Transport (A4)	Installation (A5)	Maintenance (B2)	Transport to Disposal (C2)	Disposal (C4)
RESOURCES									
RPRE	MJ	98.9	2.91	868	4.47	0.128	74.7	5.17×10^{-2}	0.139
	%	9%	0%	83%	0%	0%	7%	0%	0%
RPRM	MJ	0.00	0.00	521	0.00	0.00	0.00	0.00	0.00
	%	0%	0%	100%	0%	0%	0%	0%	0%
NRPRE	MJ	1,440	228	712	351	7.74	214	4.07	12.8
	%	48%	8%	24%	12%	0%	7%	0%	0%
NRPRM	MJ	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	%	0%	0%	0%	0%	0%	0%	0%	0%
SM	kg	9.31	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	%	100%	0%	0%	0%	0%	0%	0%	0%
RSF	MJ	Neg.	Neg.	Neg.	Neg.	Neg.	Neg.	Neg.	Neg.
NRSF	MJ	Neg.	Neg.	Neg.	Neg.	Neg.	Neg.	Neg.	Neg.
FW	m^3	0.525	2.88×10^{-2}	0.467	4.43×10^{-2}	3.82×10^{-3}	0.541	5.13×10^{-4}	7.76×10^{-3}
	%	32%	2%	29%	3%	0%	33%	0%	0%
RE	MJ	Neg.	Neg.	Neg.	Neg.	Neg.	Neg.	Neg.	Neg.
WASTES									
HWD	kg	0	0	0	0	0	0	0	0
	%	0%	0%	0%	0%	0%	0%	0%	0%
NHWD	kg	3.61	0.00	7.08	0.00	28.2	0.00	0.00	43.4
	%	4%	0%	9%	0%	34%	0%	0%	53%
HLRW	kg	0	0	0	0	0	0	0	0
	%	0%	0%	0%	0%	0%	0%	0%	0%
ILLRW	kg	0	0	0	0	0	0	0	0
	%	0%	0%	0%	0%	0%	0%	0%	0%
CRU	kg	0	0	0	0	0	0	0	0
	%	0%	0%	0%	0%	0%	0%	0%	0%
MR	kg	0.00	0.00	0.00	0.00	7.59	0.00	0.00	3.28
	%	0%	0%	0%	0%	70%	0%	0%	30%
MER	kg	Neg.	Neg.	Neg.	Neg.	Neg.	Neg.	Neg.	Neg.
EE	MJ	Neg.	Neg.	Neg.	Neg.	Neg.	Neg.	Neg.	Neg.

Table 15. *Resource use and waste flows for Float Aluminum Magnetic over a 10 year time horizon. Results reported in MJ are calculated using lower heating values. All values are rounded to three significant digits.*
Neg. = Negligible

Impact Category	Unit	Raw Materials (A1)	Upstream Transport (A2)	Manufacturing (A3)	Downstream Transport (A4)	Installation (A5)	Maintenance (B2)	Transport to Disposal (C2)	Disposal (C4)
RESOURCES									
RPRE	MJ	865	1.79	827	3.82	0.124	74.7	$4.07x10^{-2}$	0.541
	%	49%	0%	47%	0%	0%	4%	0%	0%
RPRM	MJ	0.00	0.00	504	0.00	0.00	0.00	0.00	0.00
	%	0%	0%	100%	0%	0%	0%	0%	0%
NRPRE	MJ	3,130	141	588	300	7.49	214	3.19	13.4
	%	71%	3%	13%	7%	0%	5%	0%	0%
NRPRM	MJ	0	0	0	0	0	0	0	0
	%	0%	0%	0%	0%	0%	0%	0%	0%
SM	kg	4.59	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	%	100%	0%	0%	0%	0%	0%	0%	0%
RSF	MJ	Neg.	Neg.	Neg.	Neg.	Neg.	Neg.	Neg.	Neg.
NRSF	MJ	Neg.	Neg.	Neg.	Neg.	Neg.	Neg.	Neg.	Neg.
FW	m^3	4.23	$1.78x10^{-2}$	0.388	$3.79x10^{-2}$	$3.70x10^{-3}$	0.541	$4.03x10^{-4}$	$8.43x10^{-3}$
	%	81%	0%	7%	1%	0%	10%	0%	0%
RE	MJ	Neg.	Neg.	Neg.	Neg.	Neg.	Neg.	Neg.	Neg.
WASTES									
HWD	kg	0	0	0	0	0	0	0	0
	%	0%	0%	0%	0%	0%	0%	0%	0%
NHWD	kg	3.28	0.00	5.57	0.00	20.0	0.00	0.00	35.4
	%	5%	0%	9%	0%	31%	0%	0%	55%
HLRW	kg	0	0	0	0	0	0	0	0
	%	0%	0%	0%	0%	0%	0%	0%	0%
ILLRW	kg	0	0	0	0	0	0	0	0
	%	0%	0%	0%	0%	0%	0%	0%	0%
CRU	kg	0	0	0	0	0	0	0	0
	%	0%	0%	0%	0%	0%	0%	0%	0%
MR	kg	0.00	0.00	0.00	0.00	7.34	0.00	0.00	1.27
	%	0%	0%	0%	0%	85%	0%	0%	15%
MER	kg	Neg.	Neg.	Neg.	Neg.	Neg.	Neg.	Neg.	Neg.
EE	MJ	Neg.	Neg.	Neg.	Neg.	Neg.	Neg.	Neg.	Neg.

Table 16. *Resource use and waste flows for Float Aluminum Non-Magnetic over a 10 year time horizon. Results reported in MJ are calculated using lower heating values. All values are rounded to three significant digits.*
Neg. = Negligible

Impact Category	Unit	Raw Materials (A1)	Upstream Transport (A2)	Manufacturing (A3)	Downstream Transport (A4)	Installation (A5)	Maintenance (B2)	Transport to Disposal (C2)	Disposal (C4)
RESOURCES									
RPRE	MJ	846	1.75	820	3.58	0.124	74.7	3.61×10^{-2}	0.531
	%	48%	0%	47%	0%	0%	4%	0%	0%
RPRM	MJ	0.00	0.00	504	0.00	0.00	0.00	0.00	0.00
	%	0%	0%	100%	0%	0%	0%	0%	0%
NRPRE	MJ	2,930	137	539	281	7.49	214	2.84	12.0
	%	71%	3%	13%	7%	0%	5%	0%	0%
NRPRM	MJ	0	0	0	0	0	0	0	0
	%	0%	0%	0%	0%	0%	0%	0%	0%
SM	kg	4.38	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	%	100%	0%	0%	0%	0%	0%	0%	0%
RSF	MJ	Neg.	Neg.	Neg.	Neg.	Neg.	Neg.	Neg.	Neg.
NRSF	MJ	Neg.	Neg.	Neg.	Neg.	Neg.	Neg.	Neg.	Neg.
FW	m^3	4.21	1.73×10^{-2}	0.357	3.54×10^{-2}	3.70×10^{-3}	0.541	3.58×10^{-4}	8.15×10^{-3}
	%	81%	0%	7%	1%	0%	10%	0%	0%
RE	MJ	Neg.	Neg.	Neg.	Neg.	Neg.	Neg.	Neg.	Neg.
WASTES									
HWD	kg	0	0	0	0	0	0	0	0
	%	0%	0%	0%	0%	0%	0%	0%	0%
NHWD	kg	2.93	0.00	4.94	0.00	20.0	0.00	0.00	32.4
	%	5%	0%	8%	0%	33%	0%	0%	54%
HLRW	kg	0	0	0	0	0	0	0	0
	%	0%	0%	0%	0%	0%	0%	0%	0%
ILLRW	kg	0	0	0	0	0	0	0	0
	%	0%	0%	0%	0%	0%	0%	0%	0%
CRU	kg	0	0	0	0	0	0	0	0
	%	0%	0%	0%	0%	0%	0%	0%	0%
MR	kg	0.00	0.00	0.00	0.00	7.34	0.00	0.00	0.127
	%	0%	0%	0%	0%	98%	0%	0%	2%
MER	kg	Neg.	Neg.	Neg.	Neg.	Neg.	Neg.	Neg.	Neg.
EE	MJ	Neg.	Neg.	Neg.	Neg.	Neg.	Neg.	Neg.	Neg.

Table 17. *Resource use and waste flows for Float Wood Magnetic over a 10 year time horizon. Results reported in MJ are calculated using lower heating values. All values are rounded to three significant digits.*
Neg. = Negligible

Impact Category	Unit	Raw Materials (A1)	Upstream Transport (A2)	Manufacturing (A3)	Downstream Transport (A4)	Installation (A5)	Maintenance (B2)	Transport to Disposal (C2)	Disposal (C4)
RESOURCES									
RPRE	MJ	559	1.76	823	3.69	0.124	74.7	3.82×10^{-2}	0.275
	%	38%	0%	56%	0%	0%	5%	0%	0%
RPRM	MJ	137	0.00	504	0.00	0.00	0.00	0.00	0.00
	%	21%	0%	79%	0%	0%	0%	0%	0%
NRPRE	MJ	1,610	138	561	290	7.49	214	3.00	10.3
	%	57%	5%	20%	10%	0%	8%	0%	0%
NRPRM	MJ	0	0	0	0	0	0	0	0
	%	0%	0%	0%	0%	0%	0%	0%	0%
SM	kg	4.56	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	%	100%	0%	0%	0%	0%	0%	0%	0%
RSF	MJ	Neg.	Neg.	Neg.	Neg.	Neg.	Neg.	Neg.	Neg.
NRSF	MJ	Neg.	Neg.	Neg.	Neg.	Neg.	Neg.	Neg.	Neg.
FW	m^3	1.83	1.74×10^{-2}	0.371	3.65×10^{-2}	3.70×10^{-3}	0.541	3.78×10^{-4}	6.77×10^{-3}
	%	65%	1%	13%	1%	0%	19%	0%	0%
RE	MJ	Neg.	Neg.	Neg.	Neg.	Neg.	Neg.	Neg.	Neg.
WASTES									
HWD	kg	0	0	0	0	0	0	0	0
	%	0%	0%	0%	0%	0%	0%	0%	0%
NHWD	kg	3.16	0.00	5.22	0.00	20.0	0.00	0.00	33.3
	%	5%	0%	8%	0%	32%	0%	0%	54%
HLRW	kg	0	0	0	0	0	0	0	0
	%	0%	0%	0%	0%	0%	0%	0%	0%
ILLRW	kg	0	0	0	0	0	0	0	0
	%	0%	0%	0%	0%	0%	0%	0%	0%
CRU	kg	0	0	0	0	0	0	0	0
	%	0%	0%	0%	0%	0%	0%	0%	0%
MR	kg	0.00	0.00	0.00	0.00	7.34	0.00	0.00	1.14
	%	0%	0%	0%	0%	87%	0%	0%	13%
MER	kg	Neg.	Neg.	Neg.	Neg.	Neg.	Neg.	Neg.	Neg.
EE	MJ	Neg.	Neg.	Neg.	Neg.	Neg.	Neg.	Neg.	Neg.

Table 18. *Resource use and waste flows for Float Wood Non-Magnetic over a 10 year time horizon. Results reported in MJ are calculated using lower heating values. All values are rounded to three significant digits.*
Neg. = Negligible

Impact Category	Unit	Raw Materials (A1)	Upstream Transport (A2)	Manufacturing (A3)	Downstream Transport (A4)	Installation (A5)	Maintenance (B2)	Transport to Disposal (C2)	Disposal (C4)
RESOURCES									
RPRE	MJ	540	1.69	817	3.44	0.124	74.7	3.36×10^{-2}	0.265
	%	38%	0%	57%	0%	0%	5%	0%	0%
RPRM	MJ	137	0.00	504	0.00	0.00	0.00	0.00	0.00
	%	21%	0%	79%	0%	0%	0%	0%	0%
NRPRE	MJ	1,410	133	512	270	7.49	214	2.64	8.91
	%	55%	5%	20%	11%	0%	8%	0%	0%
NRPRM	MJ	0	0	0	0	0	0	0	0
	%	0%	0%	0%	0%	0%	0%	0%	0%
SM	kg	4.36	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	%	100%	0%	0%	0%	0%	0%	0%	0%
RSF	MJ	Neg.	Neg.	Neg.	Neg.	Neg.	Neg.	Neg.	Neg.
NRSF	MJ	Neg.	Neg.	Neg.	Neg.	Neg.	Neg.	Neg.	Neg.
FW	m^3	1.81	1.68×10^{-2}	0.340	3.41×10^{-2}	3.70×10^{-3}	0.541	3.33×10^{-4}	6.48×10^{-3}
	%	66%	1%	12%	1%	0%	20%	0%	0%
RE	MJ	Neg.	Neg.	Neg.	Neg.	Neg.	Neg.	Neg.	Neg.
WASTES									
HWD	kg	0	0	0	0	0	0	0	0
	%	0%	0%	0%	0%	0%	0%	0%	0%
NHWD	kg	2.86	0.00	4.60	0.00	20.0	0.00	0.00	30.3
	%	5%	0%	8%	0%	35%	0%	0%	52%
HLRW	kg	0	0	0	0	0	0	0	0
	%	0%	0%	0%	0%	0%	0%	0%	0%
ILLRW	kg	0	0	0	0	0	0	0	0
	%	0%	0%	0%	0%	0%	0%	0%	0%
CRU	kg	0	0	0	0	0	0	0	0
	%	0%	0%	0%	0%	0%	0%	0%	0%
MR	kg	0.00	0.00	0.00	0.00	7.34	0.00	0.00	4.54×10^{-3}
	%	0%	0%	0%	0%	100%	0%	0%	0%
MER	kg	Neg.	Neg.	Neg.	Neg.	Neg.	Neg.	Neg.	Neg.
EE	MJ	Neg.	Neg.	Neg.	Neg.	Neg.	Neg.	Neg.	Neg.

Table 19. *Key Life Cycle Impact Assessment results by life cycle phase for Adapt Magnetic. Results are shown for one glassboard maintained for 10 years.*

Impact Category	Unit	Raw Materials (A1)	Upstream Transport (A2)	Manufacturing (A3)	Downstream Transport (A4)	Installation (A5)	Maintenance (B2)	Transport to Disposal (C2)	Disposal (C4)
TRACI									
Climate change potential	kg CO_2 eq	108	15.9	49.6	24.5	2.28	13.7	0.284	0.662
	%	50%	7%	23%	11%	1%	6%	0%	0%
Acidification potential	kg SO_2 eq	0.649	$6.25x10^{-2}$	0.137	$9.62x10^{-2}$	$2.84x10^{-3}$	$7.20x10^{-2}$	$1.11x10^{-3}$	$4.61x10^{-3}$
	%	63%	6%	13%	9%	0%	7%	0%	0%
Eutrophication potential	kg PO_4 eq	0.350	$1.51x10^{-2}$	0.300	$2.32x10^{-2}$	0.325	$6.94x10^{-2}$	$2.68x10^{-4}$	$1.05x10^{-3}$
	%	32%	1%	28%	2%	30%	6%	0%	0%
Ozone depletion potential	kg CFC-11 eq	$6.26x10^{-6}$	$2.74x10^{-7}$	$3.93x10^{-7}$	$4.21x10^{-7}$	$9.70x10^{-9}$	$1.13x10^{-6}$	$4.87x10^{-9}$	$1.57x10^{-8}$
	%	74%	3%	5%	5%	0%	13%	0%	0%
Photochemical oxidant creation potential (POCP)	kg O_3 eq	12.6	1.69	2.18	2.61	$8.28x10^{-2}$	0.862	$3.02x10^{-2}$	0.138
	%	62%	8%	11%	13%	0%	4%	0%	1%
CML-IA									
Abiotic depletion potential (fossil fuels)	MJ	1,320	225	601	347	7.59	196	4.01	12.6
	%	49%	8%	22%	13%	0%	7%	0%	0%

Table 20. *Key Life Cycle Impact Assessment results by life cycle phase for Float Aluminum Magnetic. Results are shown for one glassboard maintained for 10 years.*

Impact Category	Unit	Raw Materials (A1)	Upstream Transport (A2)	Manufacturing (A3)	Downstream Transport (A4)	Installation (A5)	Maintenance (B2)	Transport to Disposal (C2)	Disposal (C4)
TRACI									
Climate change potential	kg CO_2 eq	291	9.86	40.9	20.9	2.21	13.7	0.223	0.824
	%	77%	3%	11%	6%	1%	4%	0%	0%
Acidification potential	kg SO_2 eq	1.89	$3.96x10^{-2}$	0.119	$8.22x10^{-2}$	$2.75x10^{-3}$	$7.20x10^{-2}$	$8.75x10^{-4}$	$5.57x10^{-3}$
	%	85%	2%	5%	4%	0%	3%	0%	0%
Eutrophication potential	kg PO_4 eq	0.922	$9.34x10^{-3}$	0.242	$1.98x10^{-2}$	0.315	$6.94x10^{-2}$	$2.11x10^{-4}$	$2.19x10^{-3}$
	%	58%	1%	15%	1%	20%	4%	0%	0%
Ozone depletion potential	kg CFC-11 eq	$7.01x10^{-6}$	$1.69x10^{-7}$	$3.44x10^{-7}$	$3.60x10^{-7}$	$9.39x10^{-9}$	$1.13x10^{-6}$	$3.83x10^{-9}$	$1.40x10^{-8}$
	%	77%	2%	4%	4%	0%	13%	0%	0%
Photochemical oxidant creation potential (POCP)	kg O_3 eq	21.5	1.06	1.96	2.23	$8.02x10^{-2}$	0.862	$2.37x10^{-2}$	0.115
	%	77%	4%	7%	8%	0%	3%	0%	0%
CML-IA									
Abiotic depletion potential (fossil fuels)	MJ	2,920	139	499	296	7.35	196	3.15	12.8
	%	72%	3%	12%	7%	0%	5%	0%	0%

Table 21. *Key Life Cycle Impact Assessment results by life cycle phase for Float Aluminum Non-Magnetic. Results are shown for one glassboard maintained for 10 years.*

Impact Category	Unit	Raw Materials (A1)	Upstream Transport (A2)	Manufacturing (A3)	Downstream Transport (A4)	Installation (A5)	Maintenance (B2)	Transport to Disposal (C2)	Disposal (C4)
TRACI									
Climate change potential	kg CO_2 eq	274	9.58	37.4	19.6	2.21	13.7	0.198	0.734
	%	77%	3%	10%	5%	1%	4%	0%	0%
Acidification potential	kg SO_2 eq	1.83	3.76×10^{-2}	0.112	7.69×10^{-2}	2.75×10^{-3}	7.20×10^{-2}	7.77×10^{-4}	4.85×10^{-3}
	%	86%	2%	5%	4%	0%	3%	0%	0%
Eutrophication potential	kg PO_4 eq	0.848	9.07×10^{-3}	0.218	1.86×10^{-2}	0.315	6.94×10^{-2}	1.87×10^{-4}	2.06×10^{-3}
	%	57%	1%	15%	1%	21%	5%	0%	0%
Ozone depletion potential	kg CFC-11 eq	6.63×10^{-6}	1.65×10^{-7}	3.26×10^{-7}	3.37×10^{-7}	9.39×10^{-9}	1.13×10^{-6}	3.40×10^{-9}	1.23×10^{-8}
	%	77%	2%	4%	4%	0%	13%	0%	0%
Photochemical oxidant creation potential (POCP)	kg O_3 eq	20.5	1.02	1.88	2.08	8.02×10^{-2}	0.862	2.11×10^{-2}	9.23×10^{-2}
	%	77%	4%	7%	8%	0%	3%	0%	0%
CML-IA									
Abiotic depletion potential (fossil fuels)	MJ	2,740	136	459	277	7.35	196	2.80	11.5
	%	72%	4%	12%	7%	0%	5%	0%	0%

Table 22. *Key Life Cycle Impact Assessment results by life cycle phase for Float Wood Magnetic. Results are shown for one glassboard maintained for 10 years.*

Impact Category	Unit	Raw Materials (A1)	Upstream Transport (A2)	Manufacturing (A3)	Downstream Transport (A4)	Installation (A5)	Maintenance (B2)	Transport to Disposal (C2)	Disposal (C4)
TRACI									
Climate change potential	kg CO_2 eq	142	9.63	39.0	20.2	2.21	13.7	0.209	0.932
	%	62%	4%	17%	9%	1%	6%	0%	0%
Acidification potential	kg SO_2 eq	0.917	3.78×10^{-2}	0.115	7.93×10^{-2}	2.75×10^{-3}	7.20×10^{-2}	8.21×10^{-4}	3.94×10^{-3}
	%	75%	3%	9%	6%	0%	6%	0%	0%
Eutrophication potential	kg PO_4 eq	0.445	9.12×10^{-3}	0.229	1.91×10^{-2}	0.315	6.94×10^{-2}	1.98×10^{-4}	4.53×10^{-2}
	%	39%	1%	20%	2%	28%	6%	0%	4%
Ozone depletion potential	kg CFC-11 eq	4.53×10^{-6}	1.66×10^{-7}	3.34×10^{-7}	3.47×10^{-7}	9.39×10^{-9}	1.13×10^{-6}	3.59×10^{-9}	1.18×10^{-8}
	%	69%	3%	5%	5%	0%	17%	0%	0%
Photochemical oxidant creation potential (POCP)	kg O_3 eq	12.2	1.02	1.92	2.15	8.02×10^{-2}	0.862	2.23×10^{-2}	9.77×10^{-2}
	%	66%	6%	10%	12%	0%	5%	0%	1%
CML-IA									
Abiotic depletion potential (fossil fuels)	MJ	1,500	136	477	286	7.35	196	2.96	9.99
	%	57%	5%	18%	11%	0%	8%	0%	0%

Table 23. *Key Life Cycle Impact Assessment results by life cycle phase for Float Wood Non-Magnetic. Results are shown for one glassboard maintained for 10 years.*

Impact Category	Unit	Raw Materials (A1)	Upstream Transport (A2)	Manufacturing (A3)	Downstream Transport (A4)	Installation (A5)	Maintenance (B2)	Transport to Disposal (C2)	Disposal (C4)
TRACI									
Climate change potential	kg CO_2 eq	125	9.28	35.5	18.9	2.21	13.7	0.184	0.843
	%	61%	5%	17%	9%	1%	7%	0%	0%
Acidification potential	kg SO_2 eq	0.856	3.64×10^{-2}	0.108	7.40×10^{-2}	2.75×10^{-3}	7.20×10^{-2}	7.24×10^{-4}	3.22×10^{-3}
	%	74%	3%	9%	6%	0%	6%	0%	0%
Eutrophication potential	kg PO_4 eq	0.371	8.78×10^{-3}	0.206	1.79×10^{-2}	0.315	6.94×10^{-2}	1.74×10^{-4}	4.51×10^{-2}
	%	36%	1%	20%	2%	30%	7%	0%	4%
Ozone depletion potential	kg CFC-11 eq	4.16×10^{-6}	1.59×10^{-7}	3.17×10^{-7}	3.24×10^{-7}	9.39×10^{-9}	1.13×10^{-6}	3.17×10^{-9}	1.00×10^{-8}
	%	68%	3%	5%	5%	0%	19%	0%	0%
Photochemical oxidant creation potential (POCP)	kg O_3 eq	11.2	0.987	1.84	2.01	8.02×10^{-2}	0.862	1.96×10^{-2}	7.46×10^{-2}
	%	66%	6%	11%	12%	0%	5%	0%	0%
CML-IA									
Abiotic depletion potential (fossil fuels)	MJ	1,310	131	437	267	7.35	196	2.61	8.62
	%	56%	6%	18%	11%	0%	8%	0%	0%

6. LCA: Interpretation

The Upstream Raw Material Extraction and Processing life cycle phase (A1) is the largest contributor to the impact indicators evaluated. Manufacturing (A3) is the second largest contributor to the impacts evaluated. Downstream impacts, dominated by product distribution and product maintenance, are generally less than ~10-15% across the life cycle of the products.

7. References

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