Environmental Product Declaration

Sloan Valve Company | SloanStone® ELRF Sinks

Water Connects Us®

VERIFIED by SCS Global Services
ENVIRONMENTAL PRODUCT DECLARATION
BASED ON LCA

Declaration Owner

Sloan Valve Company
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Product

SloanStone® ELRF Sinks

Functional Unit

1 packaged, installed unit with a Reference Service Life of 20 years in a building with an Estimated Service Life of 75 years

EPD Number and Period of Validity

SCS-EPD-10310
EPD Valid December 19, 2024 through December 18, 2029

Product Category Rule

Sustainable Minds PCR Guidance for Building-Related Products and Services: LCA Calculation Rules and Report Requirements. Version 2023 August 2023.

Sustainable Minds Part B: Product Group Definition Commercial Lavatories. Version 1.0. October 2024.

Program Operator

SCS Global Services
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Declaration owner:	Sloan Valve Company
Address:	10500 Seymour Avenue, Franklin Park, IL 60131
Declaration Number:	SCS-EPD-10310
Declaration Validity Period:	EPD Valid December 19, 2024 through December 18, 2029
Program Operator:	SCS Global Services
Declaration URL Link:	https://www.scsglobalservices.com/certified-green-products-guide
LCA Practitioner:	Riley Tesman, SCS Global Services
LCA Software and LCI database:	OpenLCA 2.1.1 software and the Ecoinvent v3.10 database
Product's Intended Application:	Fitting designed to discharge a specific volume of water into a lavatory.
Product RSL:	20 Years (ESL 75 Years)
Markets of Applicability:	North America
EPD Type:	Product-Specific
EPD Scope:	Cradle-to-Grave
LCIA Method and Version:	CML-IA Baseline and TRACI 2.1
Independent critical review of the LCA and data, according to ISO 14044 and ISO 14071	☐ internal ☒ external
LCA Reviewer:	Lindita Bushi Lindita Bushi, PhD, Athena Sustainable Materials Institute
Product Category Rule:	Sustainable Minds PCR Guidance for Building-Related Products and Services: LCA Calculation Rules and Report Requirements. Version 2023 August 2023. SM Part B: Product group definition | Commercial lavatories | Part B #24-001.
PCR Review conducted by:	Thomas Gloria, Jack Geibig, Rifat Karim
Independent verification of the declaration and data, according to ISO 14025, ISO 21930 and the PCR:	☐ internal ☒ external
EPD Verifier:	Lindita Bushi Lindita Bushi, PhD, Athena Sustainable Materials Institute
Declaration Contents:	

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. ABOUT Sloan

Sloan is the world's leading manufacturer of commercial plumbing systems and has been in operation since 1906. Headquartered in Franklin Park, Illinois, USA, the company is at the forefront of the green building movement and provides smart, sustainable restroom solutions by manufacturing water-efficient products such as flushometers, electronic faucets, sink systems, soap dispensing systems, and vitreous china fixtures for commercial, industrial, and institutional markets worldwide.

The Sloan ELRF sinks are manufactured at the Marlik facility in San Luis Potosi, Mexico.

2. PRODUCT

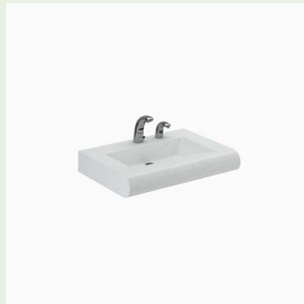
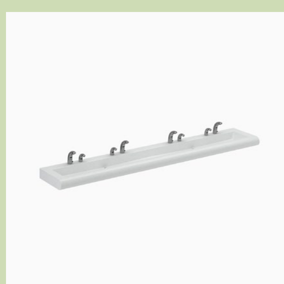
2.1 Product Description

Sloan sink products belong to the Commercial Plumbing Fixtures specification code, CSI code 22 42 39 and the UNSPSC code 30181700.

Sloan sinks are intended for use in public lavatories as the collecting unit for the water supplied, primarily for hand washing or simple rinsing. These sinks are primarily installed in the commercial environment including commercial buildings, airports, stadiums, healthcare, hospitality sectors, etc. Per the Part B PCR, a lavatory is defined as a washbowl or basin used in a bathroom, toilet room, or bathing facility. In this case, the product under study is simply the basin. No faucets or valves are being considered in the study of this product.

Sloan ELRF sinks consist of a solid surface with a thermo fixed plastic made from polyester resins and mineral loads of tri-hydrated Alumina (ATH). This LCA study includes the Sloan sink product models listed below in Table 1.

Table 1. *Sloan Optima ELRF sink models represented in this EPD.*

Model	Model Image	Model Information
ELRF 81000		■ Single molded basin ■ Basin rim angles gently into a point creating a modern look ■ Deck mounted faucets or point-of-use sensor operation ■ Easily reparable and non-porous ■ 25 Color Options* ■ Available with angle bracket or angled stainless enclosure
ELRF 82000		■ Single molded basin ■ Basin rim angles gently into a point creating a modern look ■ Deck mounted faucets or point-of-use sensor operation ■ Easily reparable and non-porous ■ 25 Color Options* ■ Available with angle bracket or angled stainless enclosure
ELRF 83000		■ Single molded basin ■ Basin rim angles gently into a point creating a modern look ■ Deck mounted faucets or point-of-use sensor operation ■ Easily reparable and non-porous ■ 25 Color Options* ■ Available with angle bracket or angled stainless enclosure
ELRF 84000		■ Single molded basin ■ Basin rim angles gently into a point creating a modern look ■ Deck mounted faucets or point-of-use sensor operation ■ Easily reparable and non-porous ■ 25 Color Options* ■ Available with angle bracket or angled stainless enclosure

*The color options do not impact the environmental indicators more than ±10%

2.2 Application

A lavatory is defined as a washbowl or basin used in a bathroom, toilet room, or bathing facility. In this case, the product under study is simply the basin. No faucets or valves are being considered in the study of this product

2.3 Representative Product

All Sloan ELRF sink product lines share similar raw material component breakdown, mass, and the same manufacturing process, with the main difference being the amount of raw material. Sloan ELRF 81000, 83000, and 84000 sinks raw materials and productions are based on quantities provided for the Sloan ERLF 82000 sink.

2.4 Flow Diagram

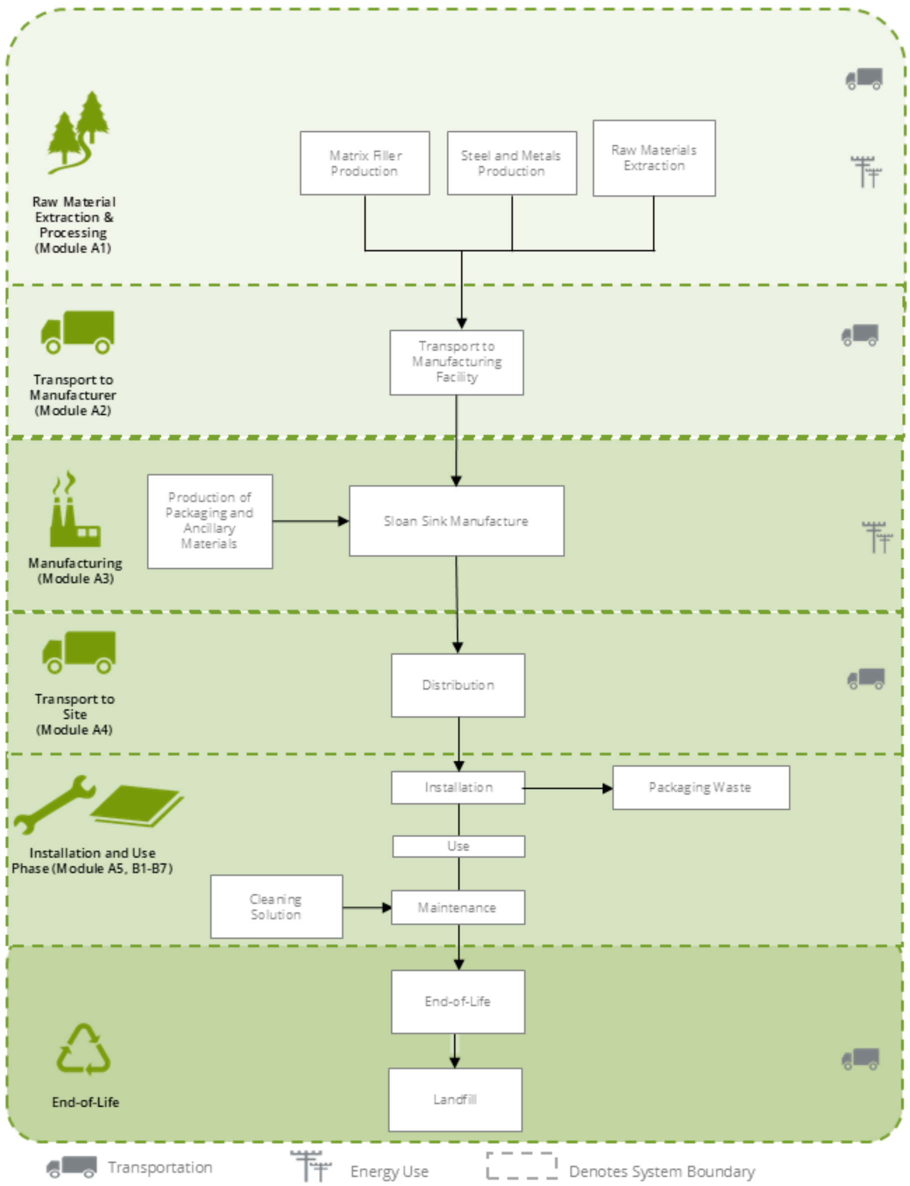


Figure 1. *Flow diagram for the Sloan ELRF sinks.*

2.5 Material Composition

Table 2. *Sloan ELRF 81000 sinks material components.*

Material	Mass Final Product (kg)	% Mass Final Product
Polyester Resin	8.25	37.0%
Aluminium Hydroxide	5.43	24.4%
Catalyst	0.33	1.46%
Matrix GE	8.03	36.0%
Pigment	0.26	1.17%
Metal Brackets	Counted in A5 but packaged with product	
Total	22.3	100%
Material	**Mass Final Product (kg)**	**% Mass Final Product**
Wood Crate	52.5	98.0%
Corner Protection	1.00	2.00%
Total:	**53.5**	**100%**

Table 3. *Sloan ELRF 82000 sinks material components.*

Material	Mass Final Product (kg)	% Mass Final Product
Polyester Resin	16.5	37.0%
Aluminium Hydroxide	10.86	24.4%
Catalyst	0.66	1.46%
Matrix GE	16.06	36.0%
Pigment	0.52	1.17%
Metal Brackets	Counted in A5 but packaged with product	
Total	**44.6**	**100%**
Material	**Mass Final Product (kg)**	**% Mass Final Product**
Wood Crate	105	98.0%
Corner Protection	2.00	2.00%
Total:	**107**	**100%**

Table 4. *Sloan ELRF 83000 sinks material components.*

Material	Mass Final Product (kg)	% Mass Final Product
Polyester Resin	24.8	37.0%
Aluminium Hydroxide	16.3	24.3%
Catalyst	0.99	1.46%
Matrix GE	24.1	36.0%
Pigment	0.78	1.17%
Metal Brackets	Counted in A5 but packaged with product	
Total	66.9	100%
Material	**Mass Final Product (kg)**	**% Mass Final Product**
Wood Crate	158	98.0%
Corner Protection	3.00	2.00%
Total:	**161**	**100%**

Table 5. *Sloan ELRF 84000 sinks material components.*

Material	Mass Final Product (kg)	% Mass Final Product
Polyester Resin	33.0	37.0%
Aluminium Hydroxide	21.7	24.3%
Catalyst	1.32	1.46%
Matrix GE	32.1	36.0%
Pigment	1.04	1.17%
Metal Brackets	Counted in A5 but packaged with product	
Total	89.2	100%
Material	**Mass Final Product (kg)**	**% Mass Final Product**
Wood Crate	210	98.0%
Corner Protection	4.00	2.00%
Total:	214	100%

3. LCA: METHODOLOGICAL FRAMEWORK

3.1 Functional Unit

According to ISO 14044, the functional unit is "the quantified performance of a product system, for use as a reference unit." Based on the Part B PCR, the functional unit is defined as one (1) packaged, installed unit with a reference service life (RSL) of 20 years studied over the estimated service life of a building. The PCR also establishes an Estimated Service Life of the building to be 75 years to be consistent with ASHRAE 189.1 (2014, Section 9.5.1), for use in the use phase modelling to fulfill the required performance and functionality over the construction works

The functional unit used in the study is one (1) packaged, installed unit with a reference service life (RSL) of 10 years. The building estimated service life (ESL) is assumed to be 75-years in order to be consistent with ASHRAE 189.1 (2014, Section 9.5.1).

Table 6. *Sloan ELRF sinks functional unit properties.*

Property	Unit	SloanStone® Sink ELRF-81000	SloanStone® Sink ELRF-82000	SloanStone® Sink ELRF-83000	SloanStone® Sink ELRF-84000
Functional Unit		One (1) packaged, installed product			
Mass	kg	79.2	158	238	317

3.2 System Boundary

The scope of the EPD is cradle-to-grave, including raw material extraction and processing; raw material transportation; product manufacture, including packaging; product distribution; installation; use; and end-of-life. This LCA follows the attributional LCA approach.

Table 7. *Sloan ELRF sink system boundaries.*

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	X	X	X	X	X	X	X	X	X	X	MND

X = Included in system boundary
MND = Module not declared

3.3 Allocation

Manufacturing resource use was allocated to the products based on mass. Impacts from transportation were allocated based on the mass of material and distance transported.

No burdens were allocated across the system boundary with secondary material, secondary fuel or recovered energy flows arising from waste.

3.3 Cut-off criteria

According to the PCR, processes contributing greater than 1% of the total environmental impact indicator for each impact are included in the inventory. No data gaps were allowed which were expected to significantly affect the outcome of the indicator results.

3.4 Data Sources

Primary data were provided by the manufacturing facility in San Luis Potosi, Mexico. The principal source of secondary LCI data is the Ecoinvent 3.10 database.

Table 8. *LCI datasets and associated databases used to model the Sloan sink products.*

Component	Dataset	Geography	Data Source	Date
Product				
MI-27 Polyester Resin	market for polyester resin, unsaturated | polyester resin, unsaturated | Cutoff, U - RoW	Global	Ecoinvent 3.10	2023
ATH	market for aluminium hydroxide | aluminium hydroxide | Cutoff, U - GLO	Global	Ecoinvent 3.10	2023
Catalyst	market for methyl ethyl ketone | methyl ethyl ketone | Cutoff, U - RoW	Global	Ecoinvent 3.10	2023
Matrix GE (Crushed Stone)	market for limestone, crushed, washed | limestone, crushed, washed | Cutoff, U - RoW	RoW[1]	Ecoinvent 3.10	2023
Pigment	market for calcium chloride | calcium chloride | Cutoff, U – RoW	RoW	Ecoinvent 3.10	2023
	market for dioctyl terephthalate | dioctyl terephthalate | Cutoff, U - GLO	Global	Ecoinvent 3.10	2023
	market for titanium dioxide | titanium dioxide | Cutoff, U - RoW	RoW	Ecoinvent 3.10	2023
Package				
Wood Crate	market for plywood | plywood | Cutoff, U - RoW	RoW	Ecoinvent 3.10	2023
Corner Protection	market for containerboard, unspecified | containerboard, unspecified | Cutoff, U	United States	Ecoinvent 3.10	2023
Ancillary				
Polly Colar	market for extrusion, plastic pipes | extrusion, plastic pipes | Cutoff, U - GLO	Global	Ecoinvent 3.10	2023
	market for extrusion, plastic pipes | extrusion, plastic pipes | Cutoff, U - GLO	Global	Ecoinvent 3.10	2023
Hose	market for synthetic rubber | synthetic rubber | Cutoff, U - GLO	Global	Ecoinvent 3.10	2023
Piece Label	market for paper, woodfree, coated | paper, woodfree, coated | Cutoff, U - RoW	RoW	Ecoinvent 3.10	2023
Inhibitor	market for methyl ethyl ketone | methyl ethyl ketone | Cutoff, U - RoW	RoW	Ecoinvent 3.10	2023
Thinner	market for solvent, organic | solvent, organic | Cutoff, U - GLO	Global	Ecoinvent 3.10	2023
Demoulding Compound	market for solvent, organic | solvent, organic | Cutoff, U - GLO	Global	Ecoinvent 3.10	2023
Wax	market for wax, lost-wax casting | wax, lost-wax casting | Cutoff, U - GLO	Global	Ecoinvent 3.10	2023
Protective Film	packaging film production, low density polyethylene | packaging film, low density polyethylene | Cutoff, U - RoW	RoW	Ecoinvent 3.10	2023
Transport				
Ship	market for transport, freight, sea, container ship | transport, freight, sea, container ship | Cutoff, U	Global	Ecoinvent 3.10	2023
Train	market for transport, freight train | transport, freight train | Cutoff, U	RoW	Ecoinvent 3.10	2023
Truck	market for transport, freight, lorry 16-32 metric ton, EURO4 | transport, freight, lorry 16-32 metric ton, EURO4 | Cutoff, U	RoW	Ecoinvent 3.10	2023
Manufacture				
Electricity (Marlik)	electricity voltage transformation from high to medium voltage | electricity, medium voltage | Cutoff, U - MX	Mexico	Ecoinvent 3.10	2023
Propane	market for liquefied petroleum gas | liquefied petroleum gas | Cutoff, U - RoW	RoW	Ecoinvent 3.10	2023
Water	market for tap water | tap water | Cutoff, U - RoW	RoW	Ecoinvent 3.10	2023
Installation Inputs				
Steel Brackets (A5)	market for steel, low-alloyed | steel, low-alloyed | Cutoff, U - GLO	GLO	Ecoinvent 3.10	2023
Waste				
Landfill	market for inert waste, for final disposal | inert waste, for final disposal | Cutoff, U	RoW	Ecoinvent 3.10	2023
Landfill	treatment of municipal solid waste, municipal incineration | municipal solid waste | Cutoff, U - RoW	RoW	Ecoinvent 3.10	2023
Wastewater	market for wastewater, average | wastewater, average | Cutoff, U	Switzerland RoW	Ecoinvent 3.10	2023

†Rest of World

[1] Rest-of-World

3.5 Data Quality

Table 9. *Data Quality Assessment.*

Data Quality Parameter	Data Quality Discussion
Time-Related Coverage: Age of data and the minimum length of time over which data is collected	The manufacturer provided primary data on product manufacturing for the Marlik facility on annual production for 2023. Representative datasets (secondary data) for upstream and background processes are generally less than 5 years old.
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 modelled for the specific electricity grids represented in this study. Surrogate data used in the assessment are representative of global or European operations and 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 component datasets, specific to the type of material, 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. Data collected for operations were typically averaged for one 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.
Representativeness: Qualitative assessment of the degree to which the data set reflects the true population of interest	Data used in the assessment represents 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 v3.10 data where available. Different portions of the product life cycle are equally considered.
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 the 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 Aquis and Marsh manufacturing facilities represent a 12-month 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 data, Ecoinvent v3.10 data 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 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 methodology includes impact potentials, which lack characterization of providing and receiving environments or tipping points.

3.6 Period under review

The period of review is based on a 12-month period from January 2023 through December 2023.

3.7 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.

3.8 Estimates and Assumptions

- Specific data on the raw material weights were not available. Percentages of the raw materials in the final product and a scrap weight were utilized to calculate the raw material inputs.
- Steel inserts drilled into Sloan sinks have been omitted from the final weight of sinks as their quantity meet the criteria of <5% cutoff and quantity are dependent on the client specification drawings for sinks.
- Steel brackets provided with the Sloan sinks are considered in the installation module (A5) but are shipped with the product from the Marlik facility. The raw materials transport (A2) module considers the transport of the brackets to the Marlik facility for shipment with the product and the distribution module (A4) considers the weight of the product shipped with the steel brackets.
- Specific data were not available on the matrix GE stone type. Secondary datasets for crushed gravel were used from the Ecoinvent database to represent these polymers in the LCA model. This assumption is tested in the sensitivity analysis.
- Product transport from the point of production to the building site is assumed to be 1600 km by truck as required by the Part B PCR.
- Installation of the products is assumed to be manual, requiring no additional materials or energy use.
- Transport of the packaging waste at installation is assumed to be 100 km by truck as required by the Part B PCR.
- Transport of the product at end-of-life to waste processing and disposal is assumed to be 100 km by truck as required by the Part B PCR.
- The Reference Service Life (RSL) of the products was modeled as 20 years, as required by the Part B PCR.
- The Estimated Service Life (ESL) of the building/construction works was assumed to be 75 years, as required by the Part B PCR, in order to be consistent with ASHRAE 189.1 (2014, Section 9.5.1).
- The maintenance of the products is assumed to include daily cleaning with a cleaning solution of 10 ml of 1% sodium lauryl sulfate solution as specified in the Part B PCR.
- No significant repair and refurbishment are expected for Sloan sinks.
- The products are assumed to require no replacement during the 20-year RSL, but in accordance with the Part A PCR and Part B PCR, requires replacement 2.75 times over the 75-year ESL.
- The use phase module B5 (Refurbishment) is assumed to have no impacts, as there is no resource or energy use associated with this module.
- The use phase modules are modelled for the building/construction works ESL of 75 years.
- For the product end-of-life, disposal of product is assumed to follow the disposal scenario indicated in the Part B PCR.

4. LCA: TECHNICAL INFORMATION AND SCENARIOS

4.1 Manufacturing

The Sloan sink products are manufactured at the Marlik facility in San Lui Potosi, Mexico. The A3 module includes the manufacturing, assembly and packaging of the final sink products at these facilities. The manufacturer provided primary data for twelve months of data including production, resource use and electricity consumption, and waste generation at the facilities. Electricity consumption is modeled using Ecoinvent datasets for the regional resource mix with the closest match to the facility. Table 10 summarizes the manufacturing inputs and outputs for the Sloan sink products.

4.3 Transportation

Transportation distance and mode from the manufacturing facilities to distribution in the United States are assumed as follows: the products from the Marlik facility are assumed to travel 1,600 km via truck for distribution per the PCR. Modeling parameters for product distribution, by transport mode and distance, are summarized in Table 10.

Table 10. *Sloan ELRF sink Transportation Summary.*

Name	Unit	Value
Vehicle Type	-	Freight Truck
Liters of fuel	l/100 km	18.7
Fuel Type	-	Diesel
Transport Distance	km	1,600
Gross mass of products transported[1]	kg	Sloan® ELRF-81000: 79.2 Sloan® ELRF-82000: 158 Sloan® ELRF-83000: 238 Sloan® ELRF-84000: 317

[1] including packaging

4.4 Installation

Installation of the product is included in the life cycle of the sink products. The installation of the sink products is completed using manual labor and does not require additional ancillary materials. Waste is generated from the disposal of the packaging material and is modeled as required by the Part A PCR through usage. Table 12 summarizes the modeling parameters for the installation phase.

Table 11. *Installation summary for Sloan sink products.*

Name	Unit	ELRF-81000	ELRF-82000	ELRF-83000	ELRF-84000
Ancillary materials	kg				
Steel Inserts		4.40	8.80	13.2	17.6
Net freshwater consumption specified by water source and fate	m^3	0	0	0	0
Other resources	kg	0	0	0	0
Electricity consumption	kwh	0	0	0	0
Other energy carriers	MJ	0	0	0	0
Product loss per functional unit	kg	0	0	0	0
Waste materials at the construction site before waste processing, generated by product installation	kg	0	0	0	0
Output materials resulting from on-site waste processing	kg	0	0	0	0
Mass of packaging waste specified by type	kg	53.5	107	161	214
Recycle	kg	36.3	2.02	1.73	2.20
Landfill	kg	13.8	1.15	1.35	1.78
Incineration	kg	3.33	0.281	0.330	0.434
Biogenic carbon contained in packaging	kg CO_2	98.1	196	294	392
Direct emissions to ambient air, soil, and water	kg	0	0	0	0
VOC emissions	μg/m^3	0	0	0	0

4.5 Use

This study of Sloan sinks includes impacts associated with use phase scenarios. As noted by Sloan, the PCR Module B3 (Repair) and Module B5 (Refurbishment) are assumed to be zero.

Module B2 includes the maintenance impacts of the product. Typical maintenance involves cleaning of the sink with a damp cloth. The Part B PCR requires the maintenance of the sink to be modeled as a commercial installation that is cleaned daily with a 10 ml 1% sodium lauryl sulfate solution. Table 13 provides the relevant information for the maintenance (Module B2) of the sinks over the RSL.

Table 12. *Use phase maintenance (Module B2) summary for Sloan sink products.*

Maintenance	Unit	ELRF-81000	ELRF-82000	ELRF-83000	ELRF-84000
Description of process	-	Daily cleaning with 10 ml 1% sodium lauryl sulfate solution			
Maintenance cycle	Cycles/RSL	5,200	5,200	5,200	5,200
Maintenance cycle	Cycles/ESL	19,500	19,500	19,500	19,500
Net freshwater consumption		-	-	-	-
Ancillary materials					
Sodium lauryl sulfate solution (per year)	kg/year	2.60	5.20	7.80	10.4
Sodium lauryl sulfate solution (per RSL)	kg/RSL	52.0	104	156	208
Sodium lauryl sulfate solution (per ESL)	kg/ESL	195	390	585	780
Other resources	kg	2.60	5.20	7.80	10.4
Energy input	kWh	0	0	0	0
Other energy carriers	kWh	0	0	0	0
Power output of equipment	kW	0	0	0	0
Waste materials from maintenance	kg	0	0	0	0
Direst emissions to ambient air, soil, and water	kg	0	0	0	0
Further assumptions for scenario development	-	-	-	-	-

Table 13. *Use phase repair (Module B3) summary for Sloan sink products.*

Repair	Unit	ELRF-81000	ELRF-82000	ELRF-83000	ELRF-84000
Repair process information	-	No significant repair is expected			
Inspection process information	-	N/A	N/A	N/A	N/A
Repair cycle	Cycles/RSL	0	0	0	0
Repair cycle	Cycles/ESL	N/A	N/A	N/A	N/A
Net freshwater consumption	m^3	0	0	0	0
Ancillary materials	kg	-	-	-	-
Energy input	kWh	-	-	-	-
Waste materials from repair	kg	-	-	-	-
Direct emissions to ambient air, soil, and water	kg	-	-	-	-
Further assumption for scenario development	-	-	-	-	-

Table 14. *Use phase replacement (Module B4) summary for Sloan sinks.*

Replacement	Unit	ELRF-81000	ELRF-82000	ELRF-83000	ELRF-84000
Reference Service Life	Years	20	20	20	20
Replacement cycle (ESL/RSL)-1	-	2.75	2.75	2.75	2.75
Energy input	kWh	0	0	0	0
Net freshwater consumption	m^3	0	0	0	0
Ancillary materials	kg	0	0	0	0
Replacement of materials	kg	0	0	0	0
Direct emissions to ambient air, soil, and water	kg	0	0	0	0
Further assumptions for scenario development	-	-	-	-	-

Table 15. *Use phase refurbishment (Module B5) summary for Sloan sinks.*

Refurbishment	Unit	ELRF-81000	ELRF-82000	ELRF-83000	ELRF-84000
Refurbishment process	-	N/A	N/A	N/A	N/A
Refurbishment cycle	Cycles/RSL	0	0	0	0
Refurbishment cycle	Cycles/ESL	0	0	0	0
Energy input	kWh	0	0	0	0
Net freshwater consumption	m^3	0	0	0	0
Material input	kg	0	0	0	0
Waste materials	kg	0	0	0	0
Direct emissions to ambient air, soil, and water	kg	0	0	0	0
Further assumption for scenario development	-	-	-	-	-

The operational use phase considers the volume of water and energy required per use. Per the Part B PCR no water or energy usage are expected for lavatory fixtures. Thus, Module B6 and B7 are reported as 0.

4.6 End-of-Life

Impacts for the deconstruction and dismantling process (Module C1) do not apply to this study as deconstruction occurs manually with hand tools requiring no energy. Transport of the waste material at end-of-life is assumed to be 100 km as indicated by the Part B PCR. Module C3 (Waste Processing) did not apply to this study as all sinks are assumed to be landfilled at end-of-life. Table 17 summarizes the relevant information for the end-of-life of Sloan sinks.

Table 16. *End-of-Life summary for Sloan sink products.*

End-of-life		Unit	ELRF-81000	ELRF-82000	ELRF-83000	ELRF-84000
Assumptions for scenario development			Manual deconstruction, followed by 100 km truck transport to final disposal in landfill			
Collection process	Collected separately	kg	0	0	0	0
	Collected with mixed construction waste	kg	22.3	44.6	66.9	89.2
Recovery	Reuse	kg	0	0	0	0
	Recycling	kg	0	0	0	0
	Landfill	kg	22.3	44.6	66.9	89.2
	Incineration	kg	0	0	0	0
	Incineration with energy recovery	kg	0	0	0	0
	Energy conversion	-	-	-	-	-
Disposal	Product of material for final deposition	kg	22.3	44.6	66.9	89.2
Removals of biogenic carbon (excluding packaging)		kg CO_2		0	0	0

5. LCA: Results

From the LCI data, impact assessment results are calculated. The choice of methods and indicators used in the assessment are based on the requirements of the Part A and Part B PCR. It should be noted that the LCIA results presented below are relative expressions and do not predict impacts on category endpoints, exceedance of thresholds, safety margins, or risks associated with the product system. Furthermore, the environmental relevance of LCIA results are not affected by LCI functional unit calculation, system wide averaging, aggregation, and allocation.

The following environmental impact category indicators are reported using characterization factors using the CML-IA impact assessment method and the TRACI 2.1 impact assessment method. Note that for global warming calculations, the CML characterization factors are based on IPCC 2013, while TRACI 2.1 global warming calculations are based on IPCC 2007. Note also that neither characterization method includes biogenic carbon uptake or biomass CO2 emissions. Based on the component materials of the product and production processes, there are no impacts associated with land-use changes, nor are environmental impacts associated with carbonation relevant for the product system.

Table 17. *Mandatory Environmental Impact Assessment Categories.*

CMLI-A Impact Category	Unit	TRACI 2.1 Impact Category	Unit
GWP: Global Warming Potential	kg CO_2 eq.	**GWP:** Global Warming Potential	kg CO_2 eq.
ODP: Depletion potential of the stratospheric ozone layer	kg CFC 11 eq.	**ODP:** Depletion potential of the stratospheric ozone layer	kg CFC 11 eq.
AP: Acidification Potential of soil and water	kg SO_2 eq.	**AP:** Acidification Potential of soil and water	kg SO_2 eq.
EP: Eutrophication Potential	kg PO_4^{3-} eq.	**EP:** Eutrophication Potential	kg N eq.
POCP: Photochemical Oxidant Creation Potential	kg C_2H_4 eq.	**SFP:** Smog Formation Potential	kg O_3 eq.
ADPE: Abiotic Depletion Potential, elements	kg Sb eq	**FFD:** Fossil Fuel Depletion	MJ Surplus
ADPF: biotic Depletion Potential, fossil fuels	MJ		

These impact categories are globally deemed mature enough to be included in Type III environmental declarations. Other categories are being developed and defined and LCA should continue making advances in their development. However, the EPD users shall not use additional measures for comparative purposes. The following inventory parameters, specified by the PCR, are also reported.

Table 18. *Additional Transparency Categories.*

Resources	Unit	Waste and Outflows	Unit
RPR_E: Renewable primary resources used as energy carrier (fuel)	MJ, LHV	**HWD:** Hazardous waste disposed	kg
RPR_M: Renewable primary resources with energy content used as material	MJ, LHV	**NHWD:** Non-hazardous waste disposed	kg
$NRPR_E$: Non-renewable primary resources used as an energy carrier (fuel)	MJ, LHV	**RWD:** Radioactive waste, conditioned, to final repository	kg
$NRPR_M$: Non-renewable primary resources with energy content used as material	MJ, LHV	**CRU:** Components for re-use	kg
SM: Secondary materials	kg	**MR:** Materials for recycling	kg
RSF: Renewable secondary fuels	MJ, LHV	**MER:** Materials for energy recovery	kg
NRSF: Non-renewable secondary fuels	MJ, LHV	**EE:** Recovered energy exported from the product system	kg
RE: Recovered energy	MJ, LHV	**EE:** Recovered energy exported from the product system	MJ, LHV
FW: Use of new freshwater resources	m^3		

Modules B1, B3, B5, B6 and B7 are not associated with any impact and are therefore declared as zero. In addition, no emissions are generated during demolition (C1), while no waste processing (C3) is required for landfill disposal. In the interest of space and table readability, these modules are not included in the results presented below.

SloanStone® ELRF Sink Results

Table 19. *Impact indicator results for Sloan ELRF-81000 sinks.*

CML Impact Method	GWP	ODP	AP	EP	POCP	ADPE	ADPF
	kg CO_2 eq	kg CFC-11 eq	kg SO_2 eq	kg PO_4^{3-} eq	kg C_2H_4 eq	kg Sb eq	MJ
A1	55.3	1.85×10^{-6}	0.212	0.407	0.178	1.10×10^{-4}	871
A2	10.0	1.20×10^{-7}	3.09×10^{-2}	1.07×10^{-2}	1.52×10^{-3}	1.43×10^{-5}	140
A3	87.7	8.76×10^{-7}	0.470	3.02	4.29×10^{-2}	9.39×10^{-5}	1,095
A1-A3 Total:	**153**	**2.84×10^{-6}**	**0.714**	**3.43**	**0.222**	**0.00**	**2,105**
A4	24.4	2.92×10^{-7}	0.08	0.03	3.71×10^{-3}	3.49×10^{-5}	340
A5	15.4	6.61×10^{-8}	3.78×10^{-2}	2.53×10^{-2}	3.65×10^{-3}	2.92×10^{-5}	119
B2	7.13	1.46×10^{-7}	3.44×10^{-2}	5.18×10^{-2}	2.39×10^{-3}	2.62×10^{-5}	99.2
B4	533	8.85×10^{-6}	2.28	9.59	0.631	0.00	7,092
C2	0.515	6.15×10^{-9}	1.59×10^{-3}	5.50×10^{-4}	7.81×10^{-5}	7.34×10^{-7}	7.16
C4	0.436	0.00	0.00	0.00	0.00	0.00	7.68

TRACI Impact Method	GWP	ODP	AP	EP	SFP	FFD
	kg CO_2 eq	kg CFC-11 eq	kg SO_2 eq	kg N eq	kg O_3 eq	MJ Surplus
A1	55.0	2.36×10^{-6}	0.222	0.316	3.36	108
A2	9.94	1.63×10^{-7}	3.73×10^{-2}	1.11×10^{-2}	0.96	19.8
A3	86.8	1.38×10^{-6}	0.576	1.34	12.2	101
A1-A3 Total:	**152**	**3.90×10^{-6}**	**0.835**	**1.66**	**16.5**	**229**
A4	24.2	3.97×10^{-7}	9.10×10^{-2}	2.70×10^{-2}	2.34	48.2
A5	15.3	9.38×10^{-8}	4.14×10^{-2}	4.98×10^{-2}	0.735	8.95
B2	7.07	1.83×10^{-7}	3.59×10^{-2}	4.62×10^{-2}	0.387	11.4
B4	528	0.00	2.67	4.79	54.1	792
C2	0.510	8.36×10^{-9}	1.92×10^{-3}	5.70×10^{-4}	0.05	1.01
C4	0.432	0.00	0.00	5.80×10^{-4}	0.06	1.10

Table 20. *Additional Resource Use and Waste indicators for Sloan ELRF-81000 sinks.*

Resource Use	RPR_E	RPR_M	$NRPR_E$	$NRPR_M$	SM	RSF	NRSF	RE	FW
	MJ	MJ	MJ	MJ	kg	MJ	MJ	MJ	m^3
A1	92.0	0.00	910	0.00	0.00	0.00	0.00	0.00	0.396
A2	1.87	0.00	141	0.00	0.00	0.00	0.00	0.00	1.94×10^{-2}
A3	2873	0.00	1179	0.00	0.00	0.00	0.00	0.00	1.94
A1-A3 Total:	**2967**	**0.00**	**2231**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.395**
A4	4.56	0.00	345	0.00	0.00	0.00	0.00	0.00	4.73×10^{-2}
A5	8.97	0.00	124	0.00	0.00	0.00	0.00	0.00	8.44×10^{-2}
B2	36.7	0.00	107	0.00	0.00	0.00	0.00	0.00	0.392
B4	8,197	0.00	7,464	0.00	0.00	0.00	0.00	0.00	6.85
C2	9.60×10^{-2}	0.00	7.26	0.00	0.00	0.00	0.00	0.00	1.00×10^{-3}
C4	9.32×10^{-2}	0.00	7.78	0.00	0.00	0.00	0.00	0.00	4.53×10^{-3}

Waste & Output	HWD	NHWD	HLRW/ILLRW	CRU	MR	MER	EE
	kg	kg	kg	kg	kg	kg	MJ, LHV
A1	0.00	0.00	0.00	0.00	0.00	0.00	0.00
A2	0.00	0.00	0.00	0.00	0.00	0.00	0.00
A3	0.200	0.960	0.00	0.00	0.340	0.00	0.00
A1-A3 Total:	**0.200**	**0.960**	**0.00**	**0.00**	**0.340**	**0.00**	**0.00**
A4	0.00	0.00	0.00	0.00	0.00	0.00	0.00
A5	0.00	16.6	0.00	0.00	35.8	0.00	0.00
B2	0.00	0.00	0.00	0.00	0.00	0.00	0.00
B4	0.550	121	0.00	0.00	99.4	0.00	0.00
C2	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C4	0.00	27.3	0.00	0.00	0.00	0.00	0.00

Table 21. *Impact indicator results for Sloan ELRF-82000 sinks.*

CML Impact Method	GWP	ODP	AP	EP	POCP	ADPE	ADPF
	kg CO_2 eq	kg CFC-11 eq	kg SO_2 eq	kg PO_4^{3-} eq	kg C_2H_4 eq	kg Sb eq	MJ
A1	111	3.70×10^{-6}	0.425	0.815	0.355	2.30×10^{-4}	1,742
A2	20.1	2.40×10^{-7}	6.18×10^{-2}	2.15×10^{-2}	3.04×10^{-3}	2.86×10^{-5}	279
A3	175	1.75×10^{-6}	0.940	6.03	8.58×10^{-2}	1.90×10^{-4}	2,190
A1-A3 Total:	**306**	**5.69×10^{-6}**	**1.43**	**6.87**	**0.44**	**4.36×10^{-4}**	**4,211**
A4	48.9	5.84×10^{-7}	0.151	5.23×10^{-2}	7.42×10^{-3}	6.97×10^{-5}	680
A5	30.8	1.32×10^{-7}	7.56×10^{-2}	5.07×10^{-2}	7.30×10^{-3}	5.85×10^{-5}	237
B2	14.3	2.93×10^{-7}	6.88×10^{-2}	0.104	4.78×10^{-3}	5.23×10^{-5}	198
B4	1,066	1.77×10^{-5}	4.57	19.2	1.26	0.00	14,185
C2	1.03	1.23×10^{-8}	3.18×10^{-3}	1.10×10^{-3}	1.56×10^{-4}	1.47×10^{-6}	14.3
C4	0.873	0.00	0.00	0.00	0.00	0.00	15.4

TRACI Impact Method	GWP	ODP	AP	EP	SFP	FFD
	kg CO_2 eq	kg CFC-11 eq	kg SO_2 eq	kg N eq	kg O_3 eq	MJ Surplus
A1	110	4.72×10^{-6}	0.444	0.631	6.73	216
A2	19.9	3.26×10^{-7}	7.47×10^{-2}	2.21×10^{-2}	1.92	39.5
A3	174	2.76×10^{-6}	1.15	2.67	24.4	202
A1-A3 Total:	**303**	**7.80×10^{-6}**	**1.67**	**3.33**	**33.0**	**457**
A4	48.5	7.93×10^{-7}	0.18	0.05	4.68	96.3
A5	30.6	1.88×10^{-7}	8.28×10^{-2}	9.96×10^{-2}	1.47	17.9
B2	14.1	3.66×10^{-7}	7.17×10^{-2}	9.24×10^{-2}	0.774	22.8
B4	1,057	2.43×10^{-5}	5.34	9.58	108	1,583
C2	1.02	1.67×10^{-8}	3.84×10^{-3}	1.14×10^{-3}	9.86×10^{-3}	2.03
C4	0.863	0.00	0.00	1.16×10^{-3}	0.113	2.21

Table 22. *Additional Resource Use and Waste indicators for Sloan ELRF-82000 sinks.*

Resource Use	RPR_E	RPR_M	$NRPR_E$	$NRPR_M$	SM	RSF	NRSF	RE	FW
	MJ	MJ	MJ	MJ	kg	MJ	MJ	MJ	m^3
A1	184	0.00	1,821	0.00	0.00	0.00	0.00	0.00	0.79
A2	3.74	0.00	283	0.00	0.00	0.00	0.00	0.00	3.88×10^{-2}
A3	5,746	0.00	2,358	0.00	0.00	0.00	0.00	0.00	3.87
A1-A3 Total:	**5,934**	**0.00**	**4,462**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.395**
A4	9.12	0.00	689	0.00	0.00	0.00	0.00	0.00	9.45×10^{-3}
A5	17.9	0.00	247	0.00	0.00	0.00	0.00	0.00	0.169
B2	73.4	0.00	215	0.00	0.00	0.00	0.00	0.00	0.784
B4	16,393	0.00	14,928	0.00	0.00	0.00	0.00	0.00	13.7
C2	0.192	0.00	14.5	0.00	0.00	0.00	0.00	0.00	2.00×10^{-3}
C4	0.186	0.00	15.6	0.00	0.00	0.00	0.00	0.00	9.06×10^{-3}

Waste & Output	HWD	NHWD	HLRW/ILLRW	CRU	MR	MER	EE
	kg	kg	kg	kg	kg	kg	MJ, LHV
A1	0.00	0.00	0.00	0.00	0.00	0.00	0.00
A2	0.00	0.00	0.00	0.00	0.00	0.00	0.00
A3	0.400	1.92	0.00	0.00	0.690	0.00	0.00
A1-A3 Total:	**0.400**	**1.92**	**0.00**	**0.00**	**0.690**	**0.00**	**0.00**
A4	0.00	0.00	0.00	0.00	0.00	0.00	0.00
A5	0.00	33.3	0.00	0.00	71.6	0.00	0.00
B2	0.00	0.00	0.00	0.00	0.00	0.00	0.00
B4	1.10	242	0.00	0.00	199	0.00	0.00
C2	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C4	0.00	54.6	0.00	0.00	0.00	0.00	0.00

Table 23. *Impact indicator results for Sloan ELRF-83000 sinks.*

CML Impact Method	GWP	ODP	AP	EP	POCP	ADPE	ADPF
	kg CO_2 eq	kg CFC-11 eq	kg SO_2 eq	kg PO_4^{3-} eq	kg C_2H_4 eq	kg Sb eq	MJ
A1	166	5.55×10^{-6}	0.637	1.22	0.533	3.40×10^{-4}	2,613
A2	30.1	3.59×10^{-7}	9.27×10^{-2}	3.22×10^{-2}	4.57×10^{-3}	4.29×10^{-5}	419
A3	263	2.63×10^{-6}	1.41	9.05	0.129	2.80×10^{-4}	3,285
A1-A3 Total:	**459**	**8.53×10^{-6}**	**2.14**	**10.3**	**0.666**	**0.00**	**6,316**
A4	73.3	8.75×10^{-7}	0.226	7.84×10^{-2}	1.11×10^{-2}	1.05×10^{-4}	1,020
A5	46.3	1.98×10^{-7}	0.113	7.60×10^{-2}	1.10×10^{-2}	8.77×10^{-5}	356
B2	21.4	4.39×10^{-7}	0.103	0.16	7.17×10^{-3}	7.85×10^{-5}	297
B4	1,600	2.65×10^{-5}	6.85	28.8	1.89	0.00	21,277
C2	1.54	1.84×10^{-8}	4.77×10^{-3}	1.65×10^{-3}	2.34×10^{-4}	2.20×10^{-6}	21.5
C4	1.31	0.00	5.22×10^{-3}	0.00	0.00	0.00	23.0

TRACI Impact Method	GWP	ODP	AP	EP	SFP	FFD
	kg CO_2 eq	kg CFC-11 eq	kg SO_2 eq	kg N eq	kg O_3 eq	MJ Surplus
A1	165	7.08×10^{-6}	0.666	0.947	10.1	324
A2	29.8	4.88×10^{-7}	0.112	3.32×10^{-2}	2.88	59.3
A3	260	4.14×10^{-6}	1.73	4.01	36.5	303
A1-A3 Total:	**455**	**1.17×10^{-5}**	**2.51**	**4.99**	**49.5**	**686**
A4	72.7	1.19×10^{-6}	0.273	8.09×10^{-2}	7.02	144
A5	46.0	2.81×10^{-7}	0.124	0.149	2.21	26.9
B2	21.2	5.49×10^{-7}	0.108	0.139	1.16	34.2
B4	1,585	3.64×10^{-5}	8.02	14.4	162	2,375
C2	1.53	2.51×10^{-8}	5.76×10^{-3}	1.71×10^{-3}	0.148	3.04
C4	1.30	0.00	6.39×10^{-3}	1.74×10^{-3}	0.170	3.31

Table 24. *Additional Resource Use and Waste indicators for Sloan ELRF-83000 sinks.*

Resource Use	RPR_E	RPR_M	$NRPR_E$	$NRPR_M$	SM	RSF	NRSF	RE	FW
	MJ	MJ	MJ	MJ	kg	MJ	MJ	MJ	m^3
A1	276	0.00	2,731	0.00	0.00	0.00	0.00	0.00	1.19
A2	5.61	0.00	424	0.00	0.00	0.00	0.00	0.00	5.82×10^{-2}
A3	8,619	0.00	3,538	0.00	0.00	0.00	0.00	0.00	5.81
A1-A3 Total:	**8,901**	**0.00**	**6,693**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.395**
A4	13.7	0.00	1,034	0.00	0.00	0.00	0.00	0.00	0.142
A5	26.9	0.00	371	0.00	0.00	0.00	0.00	0.00	0.253
B2	110	0.00	322	0.00	0.00	0.00	0.00	0.00	1.176
B4	24,590	0.00	22,392	0.00	0.00	0.00	0.00	0.00	20.5
C2	0.288	0.00	21.8	0.00	0.00	0.00	0.00	0.00	3.00×10^{-3}
C4	0.280	0.00	23.3	0.00	0.00	0.00	0.00	0.00	1.36×10^{-2}

Waste & Output	HWD	NHWD	HLRW/ILLRW	CRU	MR	MER	EE
	kg	kg	kg	kg	kg	kg	MJ, LHV
A1	0.00	0.00	0.00	0.00	0.00	0.00	0.00
A2	0.00	0.00	0.00	0.00	0.00	0.00	0.00
A3	0.600	2.88	0.00	0.00	1.03	0.00	0.00
A1-A3 Total:	**0.600**	**2.88**	**0.00**	**0.00**	**1.03**	**0.00**	**0.00**
A4	0.00	0.00	0.00	0.00	0.00	0.00	0.00
A5	0.00	49.9	0.00	0.00	107	0.00	0.00
B2	0.00	0.00	0.00	0.00	0.00	0.00	0.00
B4	1.65	362	0.00	0.00	298	0.00	0.00
C2	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C4	0.00	81.9	0.00	0.00	0.00	0.00	0.00

Table 25. *Impact indicator results for Sloan ELRF-84000 sinks.*

CML Impact Method	GWP	ODP	AP	EP	POCP	ADPE	ADPF
	kg CO_2 eq	kg CFC-11 eq	kg SO_2 eq	kg PO_4^{3-} eq	kg C_2H_4 eq	kg Sb eq	MJ
A1	221	7.39×10^{-6}	0.850	1.63	0.710	4.40×10^{-4}	3,483
A2	40.1	4.79×10^{-7}	0.124	4.29×10^{-2}	6.08×10^{-3}	5.72×10^{-5}	558
A3	351	3.50×10^{-6}	1.88	12.1	0.172	3.75×10^{-4}	4,380
A1-A3 Total:	**612**	**1.14×10^{-5}**	**2.85**	**13.7**	**0.888**	**8.73×10^{-4}**	**8,422**
A4	97.8	1.17×10^{-6}	0.301	0.105	1.48×10^{-2}	1.39×10^{-4}	1,360
A5	61.7	2.65×10^{-7}	0.151	0.101	1.46×10^{-2}	1.17×10^{-4}	475
B2	28.5	5.86×10^{-7}	0.138	0.207	9.56×10^{-3}	1.05×10^{-4}	397
B4	2,133	3.54×10^{-5}	9.13	38.3	2.52	3.16×10^{-3}	28,370
C2	2.06	2.46×10^{-8}	6.36×10^{-3}	2.20×10^{-3}	3.13×10^{-4}	2.94×10^{-6}	28.6
C4	1.75	0.00	6.96×10^{-3}	0.00	0.00	0.00	30.7

TRACI Impact Method	GWP	ODP	AP	EP	SFP	FFD
	kg CO_2 eq	kg CFC-11 eq	kg SO_2 eq	kg N eq	kg O_3 eq	MJ Surplus
A1	220	9.44×10^{-6}	0.888	1.26	13.5	431
A2	39.8	6.51×10^{-7}	0.149	4.43×10^{-2}	3.84	79.0
A3	347	5.52×10^{-6}	2.30	5.35	48.7	404
A1-A3 Total:	**607**	**1.56×10^{-5}**	**3.34**	**6.66**	**66.0**	**915**
A4	96.9	1.59×10^{-6}	0.364	0.108	9.37	193
A5	61.3	3.75×10^{-7}	0.166	0.199	2.94	35.8
B2	28.3	7.31×10^{-7}	0.143	0.185	1.55	45.6
B4	2,114	4.85×10^{-5}	10.7	19.2	217	3,166
C2	2.04	3.34×10^{-8}	7.68×10^{-3}	2.28×10^{-3}	0.20	4.06
C4	1.73	0.00	0.01	2.32×10^{-3}	0.23	4.41

Table 26. *Additional Resource Use and Waste indicators for Sloan ELRF-84000 sinks.*

Resource Use	RPR_E	RPR_M	$NRPR_E$	$NRPR_M$	SM	RSF	NRSF	RE	FW
	MJ	MJ	MJ	MJ	kg	MJ	MJ	MJ	m^3
A1	368	0.00	3,641	0.00	0.00	0.00	0.00	0.00	1.59
A2	7.48	0.00	566	0.00	0.00	0.00	0.00	0.00	7.76×10^{-2}
A3	11,492	0.00	4,717	0.00	0.00	0.00	0.00	0.00	7.75
A1-A3 Total:	**11,867**	**0.00**	**8,924**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.395**
A4	54.7	0.00	4,134	0.00	0.00	0.00	0.00	0.00	0.57
A5	35.9	0.00	494	0.00	0.00	0.00	0.00	0.00	0.338
B2	147	0.00	430	0.00	0.00	0.00	0.00	0.00	1.568
B4	32,786	0.00	29,856	0.00	0.00	0.00	0.00	0.00	27.4
C2	0.384	0.00	29.0	0.00	0.00	0.00	0.00	0.00	3.98×10^{-3}
C4	0.373	0.00	31.1	0.00	0.00	0.00	0.00	0.00	0.02

Waste & Output	HWD	NHWD	HLRW/ILLRW	CRU	MR	MER	EE
	kg	kg	kg	kg	kg	kg	MJ, LHV
A1	0.00	0.00	0.00	0.00	0.00	0.00	0.00
A2	0.00	0.00	0.00	0.00	0.00	0.00	0.00
A3	0.800	3.84	0.00	0.00	1.37	0.00	0.00
A1-A3 Total:	**0.800**	**3.84**	**0.00**	**0.00**	**1.37**	**0.00**	**0.00**
A4	0.00	0.00	0.00	0.00	0.00	0.00	0.00
A5	0.00	66.5	0.00	0.00	143	0.00	0.00
B2	0.00	0.00	0.00	0.00	0.00	0.00	0.00
B4	2.20	483	0.00	0.00	398	0.00	0.00
C2	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C4	0.00	109	0.00	0.00	0.00	0.00	0.00

6. LCA: INTERPRETATION

The interpretation phase conforms to ISO 14044. The interpretation included the use of evaluation and sensitivity checks to steer the iterative process during the assessment, and a final evaluation including completeness, sensitivity, and consistency checks, at the end of the study.

Results are summarized by the life cycle phase for a cradle-to-grave assessment of the Sloan ELRF-81000, ELRF-82000, ELRF-83000, and ELRF-84000 products over a 20-year reference service life and a 75-year building estimated service life. The total impact indicator results are dominated by the replacement phase. Examining results outside of the B4 module, the manufacturing (A3) and raw materials (A1) modules are the most significant contributors to the impact indicators.

Figures 2 through 5 show the contribution analysis of the CML-IA impact indicator results for the sink products over the 75-year ESL.

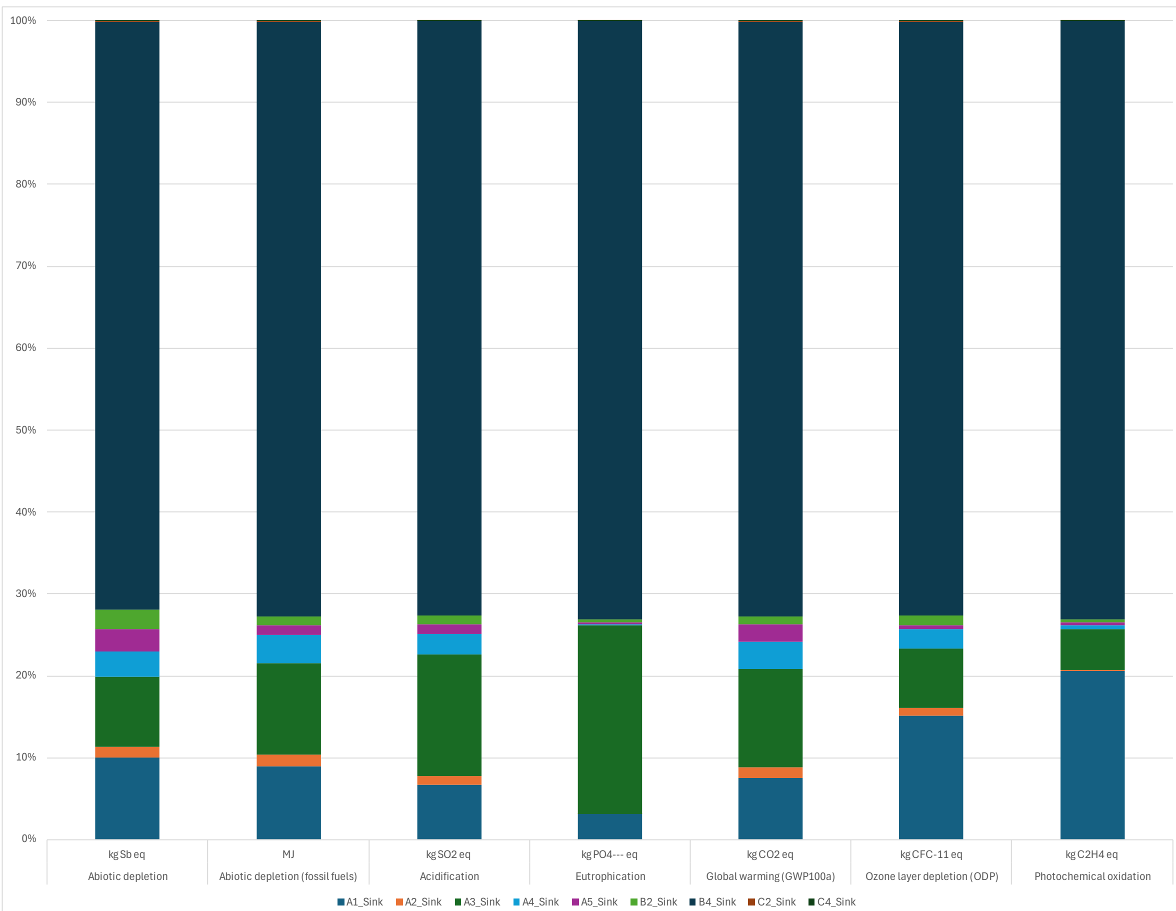


Figure 2. *Contribution analysis for the Sloan ELRF-81000 sinks (75-year ESL).*

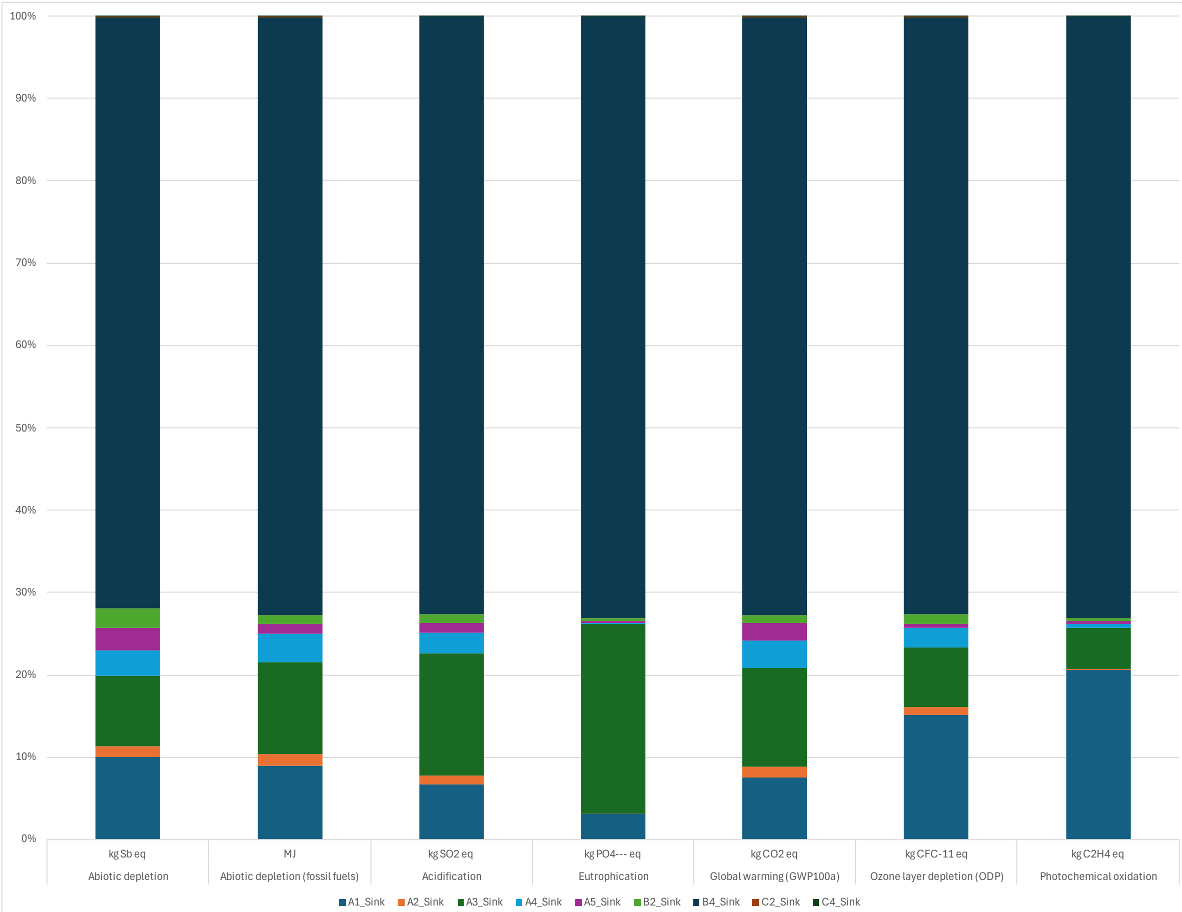


Figure 3. *Contribution analysis for the Sloan ELRF-82000 sinks (75-year ESL).*

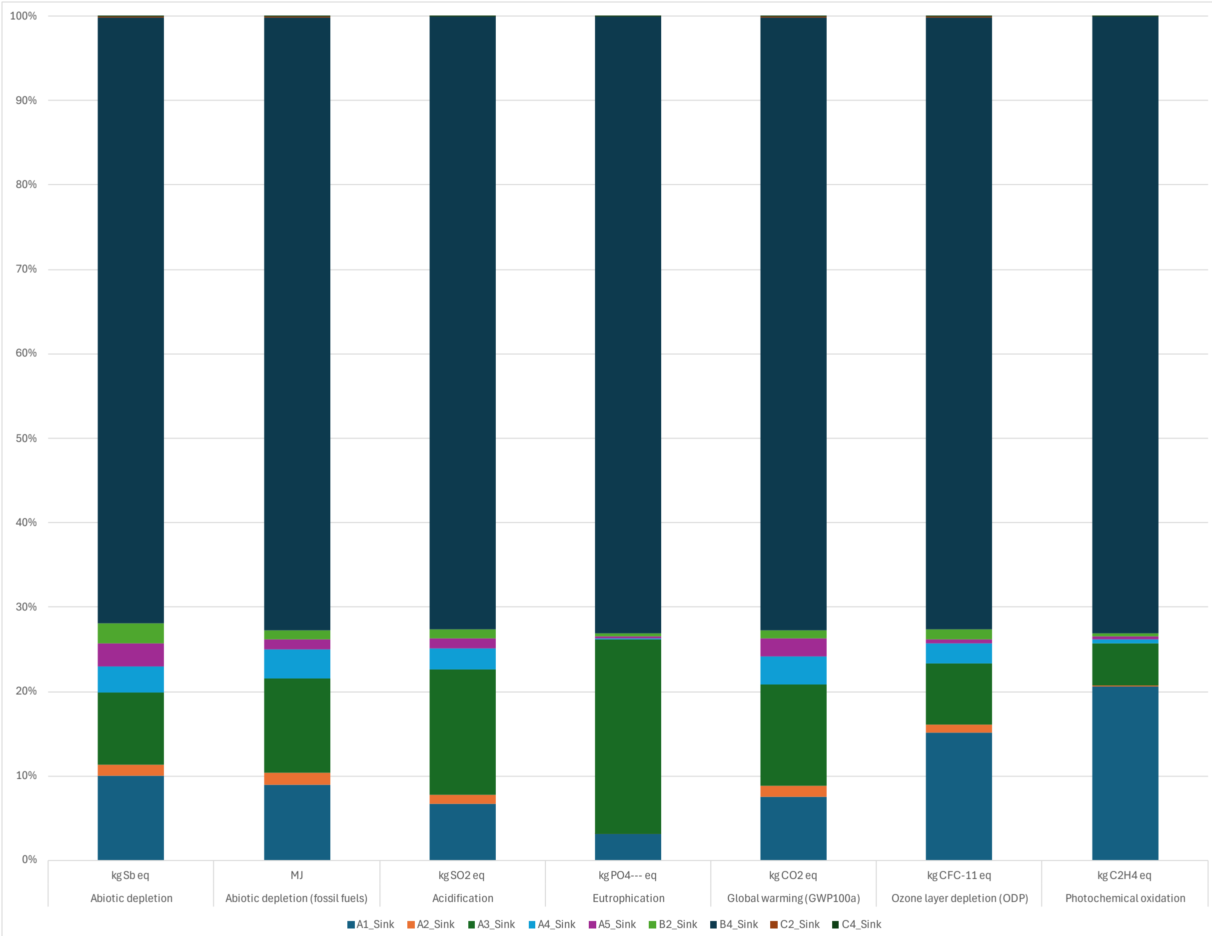


Figure 4. *Contribution analysis for the Sloan ELRF-83000 sinks (75-year ESL).*

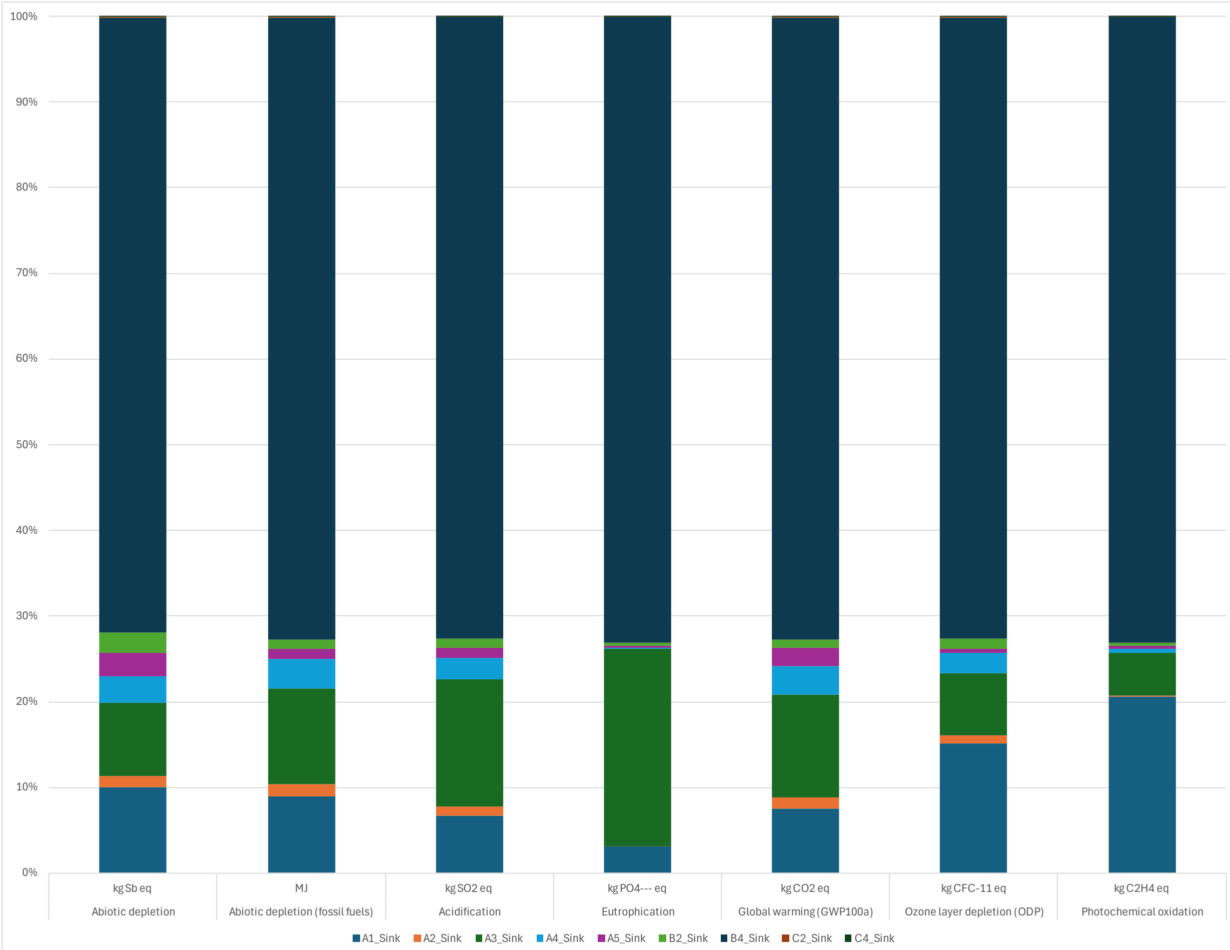


Figure 5. *Contribution analysis for the Sloan ELRF-84000 sinks (75-year ESL).*

7. ADDITIONAL ENVIRONMENTAL INFORMATION

Sloan is a proud member of the United States Green Building Council (USGBC) and through the use of Leadership in Energy and Environmental Design (LEED) Green Building Rating System, Sloan recognizes and validates the importance of best-on-class building strategies and practices of high performing green buildings. Sloan's ELRF sinks within this EPD can be used to help achieve water efficiency goals as well as gaining USGBC LEED v4 points and complying with building codes.

No environmental or health impacts are expected due to extraordinary effects including fire and/or water damage and product destruction.

For more information on Sloan's certifications and environmental initiatives please visit the website at www.sloan.com.

8. REFERENCES

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