

**Declaration Owner**

Trinseo

7350 Empire Drive, Florence, Kentucky 41042

+1.800.354.9858

info@trinseo.com; aristechinfo@trinseo.com

www.trinseo.com; www.aristechsolutions.com

Product

AVONITE™ Solid Surface

Declared Unit

1 m² of countertop

EPD Number and Period of Validity

SCS-EPD-09485

EPD Valid October 25, 2023 through October 24, 2028

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

2000 Powell Street, Ste. 600, Emeryville, CA 94608

+1.510.452.8000 | www.SCSglobalServices.com



Declaration owner:	Trinseo
Address:	7350 Empire Drive, Florence, Kentucky 41042
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Declaration Validity Period:	EPD Valid October 25, 2023 through October 24, 2028
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 1.11 software and the Ecoinvent v3.9.1 database
Markets of Applicability:	North America
EPD Type:	Product-Specific
EPD Scope:	Cradle-to-Gate plus end-of-life
LCIA Method and Version:	TRACI 2.1, CML-IA and EN 15804
Independent critical review of the LCA and data, according to ISO 14044, ISO 21930	<input type="checkbox"/> internal <input checked="" type="checkbox"/> external
LCA Reviewer:	 Lindita Bushi, Ph.D., Athena Sustainable Materials Institute.
Product Category Rule:	ISO 21930:2017 Sustainability in buildings and civil engineering works – Core rules for environmental product declarations of construction products and services
Independent verification of the declaration and data, according to ISO 14025, and ISO 21930	<input type="checkbox"/> internal <input checked="" type="checkbox"/> external
EPD Verifier:	 Lindita Bushi, Ph.D., Athena Sustainable Materials Institute.
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<p>Disclaimers: This EPD conforms to ISO 14025, 14040, 14044, and ISO 21930.</p> <p>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.</p> <p>Accuracy of Results: Due to PCR constraints, this EPD provides estimations of potential impacts that are inherently limited in terms of accuracy.</p> <p>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.</p> <p>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.</p>	

1. About Trinseo

Trinseo is a specialty material solutions provider that partners with companies to bring ideas to life in an imaginative, smart and sustainability-focused manner. Combining premier expertise, future-focused innovations and best-in-class materials, Trinseo unlocks value for companies and consumers alike. From design to manufacturing, Trinseo taps into decades of experience in diverse material solutions to address our customers' unique challenges across a wide range of industries, including building and construction, consumer goods, medical and mobility. Since the beginning, Trinseo has continued to grow its capabilities through the acquisition of additional businesses and assets across the globe. Trinseo's employees bring endless creativity to reimagining the possibilities with clients all over the world from the company's locations in North America, Europe and Asia Pacific.

2. PRODUCT

2.1 Product Description

AVONITE™ is a global leading brand of solid surface products for the architecture and design community. AVONITE offers a broad palette of colors and designs for commercial and institutional projects. It can be used in vertical or horizontal applications, applied in straight or curved lines, or thermoformed into a myriad of shapes for countertops, wet walls, divider panels, sinks and showers, furniture, interior and exterior architectural features, and many other uses your imagination can conceive. In accordance with the PCR, the product is classified in this EPD as polymeric solid surface countertop. The manufacturer warrants for a period of 10 years from the date of purchase.

AVONITE products are available in popular 12 mm thickness, plus 3 mm to 18 mm. Sheets are available in the industry standard 30 in x 144 in and in our exclusive "RIGHT SIZE™" widths from 24 in to 60 in in custom lengths to minimize waste and scrap and reduce seaming and installation labor. The CSI Code of the declared product is 06 64 00.



2.2 Technical Specifications

AVONITE products conform to the following specifications:

- NSF/ANSI 51 – Food equipment materials
- ISFA-2-01 (2013) Classification and standard for solid surfacing material
- ISFA-2-02 (2013) Fabrication standard for solid surfacing material
- ISO 19712-1 Classification and specification of solid surfaces
- ISO 19712-2 Classification and specification of sheets

Table 1. Product characteristics for AVONITE™.

Characteristic	Nominal Value	Unit
Sheet thickness	12 (0.50)	mm (inch)
Sheet length	3,658 (144)	mm (inch)
Sheet width	762 (30.0)	mm (inch)
Sheet weight	20.86 (4.3)	kg/m ² (lb/ft ²)
VOC Emissions Test Method	Indoor Advantage Gold™	-

Table 2. Product performance test results for AVONITE™.

Properties	Unit	Results	Test Method
General			
Nominal Thickness	mm	12	-
Density	g/cm ³	1.73	ASTM D-792
Water Absorption (24hrs.)	%	0.04	ASTM D-570
Mechanical			
Tensile Strength	psi	4,500	ASTM D-638
Tensile Modulus	psi	1,525,000	ASTM D-638
Tensile Elongation	%	0.40	ASTM D-638
Flexural Strength	psi	9,300	ASTM D-790
Flexural Modulus	psi	1,260,000	ASTM D-790
Barcol Hardness	-	63	ASTM D-2583
Rockwell Hardness (M Scale)	-	94	ASTM D-785
Charpy Impact	ft-lbs/inch	1.10	ASTM D-6110
Ball impact (1/2 lb. ball, no failure)	inches	>150	NEMA LD3-3.8
Thermal			
DTUL @ 264 psi	°F	215	ASTM D-648
Coefficient of Thermal Expansion	in/in °F	2.09x10 ⁻⁵	ASTM D-696
Boiling Water Resistance	-	No Effect	ISFA 2-01
High Temperature Resistance	-	No Effect	ISFA 2-01
Reaction to Fire	-	Class A	ASTM E-84
Combustion Toxicity	-	98	Pittsburgh Protocol
Total Volatile Organic Compounds	µg/m ² /hr	69.1	ASTM D-5116
Surface			
Consistency of Color (Same Sheet)	-	Passes	ISFA 2-01
Light Resistance	-	No Effect	ISFA 2-01
Cleanability/Stain Resistance	-	Passes	NEMA LD3-3.4
Stain Resistance	-	Passes	ANZI/ICPA SS-1
Bacterial Resistance	-	No Growth	ASTM G-22
Fungi Resistance	-	No Growth	ASTM G-21
Food Zone Use	-	Approved	NSF 51

2.3 Flow Diagram

The diagram below is a representation of the most significant contributions to the life cycle of AVONITE™. This includes material acquisition and pre-processing, manufacturing, and end-of-life.

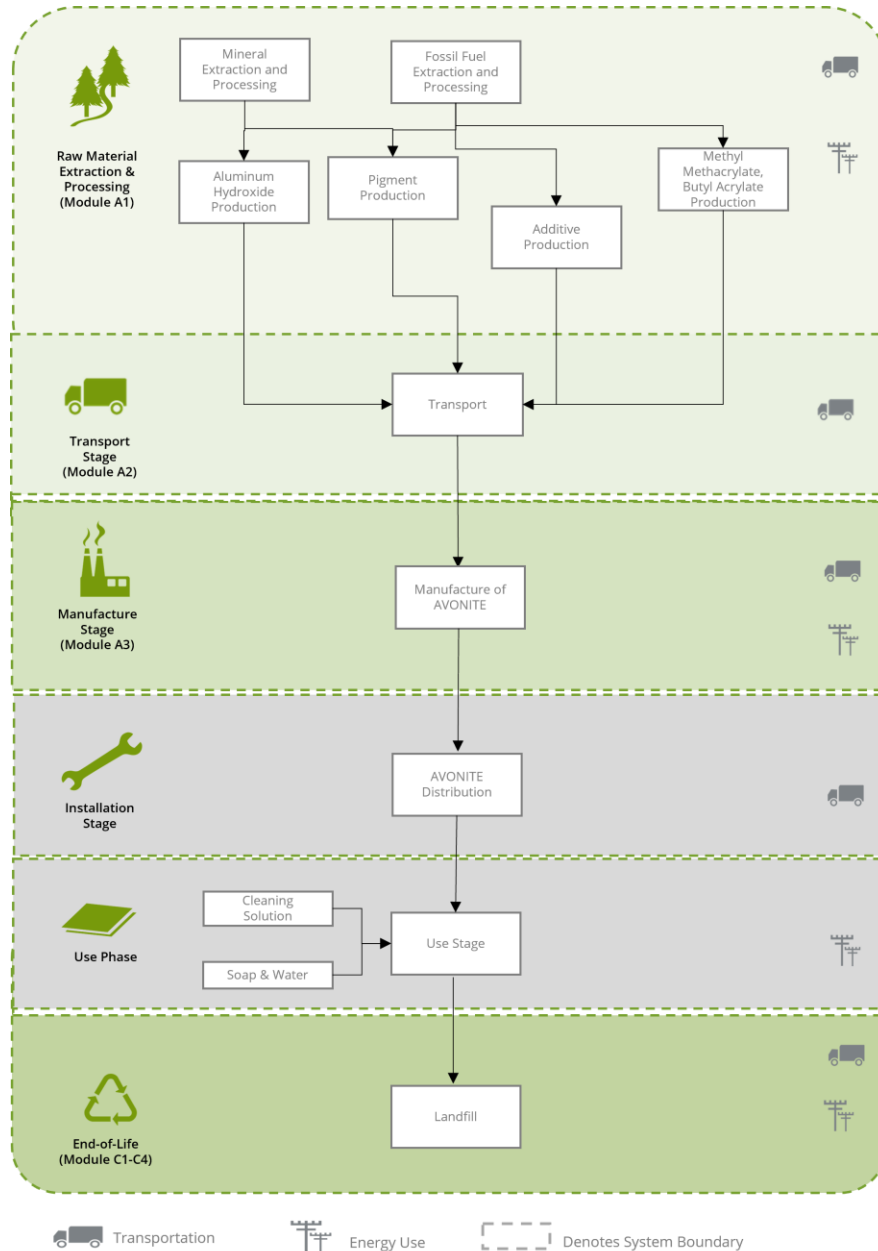


Figure 1. Flow diagram for AVONITE™.

2.4 Application

AVONITE can be used in vertical or horizontal applications, applied in straight or curved lines, or thermoformed into a myriad of shapes for countertops, wet walls, divider panels, sinks and showers, furniture, interior and exterior architectural features, and many other uses.

2.5 Declaration of Methodological Framework

The scope of the EPD is cradle-to-gate plus end-of-life, including raw material extraction and processing; raw material transportation; product manufacture; and end-of-life.

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.

Processes contributing greater than 1% of the total environmental impact indicator for each impact are included in the inventory. No known flows were deliberately excluded from this EPD.

This LCA follows the attributional approach.

2.6 Material Composition

The material composition for the AVONITE products are presented in Table 3. 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.

Table 3. Material composition of AVONITE™ in kilograms per functional unit and in percentage of total weight.

Material	Amount in Final Product (kg/m ²)	Percent of Total (%)	Biogenic Carbon Removals (kg CO ₂ eq)
Product			
Alumina trihydrate	13.5	64.6%	0.00
Acrylic resin	7.15	34.2%	0.00
Other ingredients	0.225	1.08%	0.00
Total	20.8	100%	0.00
Packaging			
Wood pallet	1.81	99.5%	2.22
Protective film (LDPE)	6.27x10 ⁻³	0.5%	0.00
Total	1.82	100%	2.22

2.7 Transportation

Transportation for the raw materials is based on data provided by the manufacturer for transport from the raw material component processing to the Florence, Kentucky manufacturing facility. Road transport is assumed to be by diesel truck.

2.8 Manufacturing

AVONITE is manufactured at the Trinseo facility in Florence, Kentucky. Raw materials, including methyl methacrylate (MMA), are measured and melted together before being mixed with aluminum trihydrate (ATH) in a mixing tank. The slurry with hardener is subsequently poured onto a belt for casting, which undergoes a chemical reaction to form a solid surface. The solid surface sheet then goes through a finishing and polishing process before being cleaned and inspected prior to a film lamination process. Finally, the final solid surface product is stacked and packaged before being shipped for distribution.

2.9 Packaging

The packaging used include protective film and wooden pallets.

2.10 End-of-Life

It is assumed that the products at end-of-life are disposed of in a landfill as an inert material. Transportation of all waste material at end-of-life assumes a 20-mile (32 kilometers) distance to disposal, consistent with assumptions made in the US EPA WARM model.



3. LCA Calculation Rules

3.1 Declared Unit

The declared unit used in the study is one (1) square meter of countertop.

3.2 System Boundary

The scope of the EPD is cradle-to-gate plus end-of-life, including raw material extraction and processing; raw material transportation; product manufacture and end-of-life.

Table 4. AVONITE™ System Boundaries.

Product Stage			Construction Stage		Use Stage							End-of-life Stage				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	MND	MND	MND	MND	MND	MND	MND	MND	MND	X	X	X	X	MND

X = Included in system boundary

MND = Module not declared

3.3 Estimates and Assumptions

- The Florence, Kentucky facility is located in the SRTV eGRID EPA NERC subregion. An Ecoinvent inventory dataset was modified to reflect the eGRID energy mix to estimate resource use and emissions from electricity use at the manufacturing facility.

- The Belen, New Mexico facility is located in the AZNM eGRID EPA NERC subregion. An Ecoinvent inventory dataset was modified to reflect the eGRID energy mix to estimate resource use and emissions from electricity use at the manufacturing facility.
- Inventory data for raw materials, packaging, and ancillary materials were modeled with unit process data taken from Ecoinvent. Specific life cycle inventory data for the production of some material components were not available. Representative data taken from Ecoinvent 3.9 database are used to model the actual processes. The datasets used for each material component are provided in Table 14.
- Production scrap rates were estimated based on the total material input and final product composition.
- It is assumed that the product at end-of-life is disposed of in a landfill as an inert material and is transported via truck 20 miles (32 km) to disposal, consistent with the assumption made in the US EPA WARM model.

3.4 Cut-off Rules

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.

3.5 Data Sources

Primary data for AVONITE™ were provided by Trinseo for the Florence, Kentucky facility. The principal source of secondary LCI data is the Ecoinvent 3.9.1 database.

Table 5. LCI datasets and associated databases used to model the AVONITE™ product system.

Flow	Dataset	Data Source	Publication Date
Product Materials			
Alumina trihydrate	market for aluminium hydroxide aluminium hydroxide Cutoff, U - GLO	Ecoinvent 3.9	2022
Methyl methacrylate	market for methyl methacrylate methyl methacrylate Cutoff, U - RER	Ecoinvent 3.9	2022
Packaging			
Protection Film	packaging film production, low density polyethylene packaging film, low density polyethylene Cutoff, U - RER	Ecoinvent 3.9	2022
Wooden Pallet	EUR-flat pallet production EUR-flat pallet Cutoff, U - RER	Ecoinvent 3.9	2022
Ancillary Materials			
PVC Gasket	extrusion, co-extrusion of plastic sheets extrusion, co-extrusion Cutoff, U - RoW; polyvinylchloride production, bulk polymerisation polyvinylchloride, bulk polymerised Cutoff, U - RER	Ecoinvent 3.9	2022
Electricity/Heat/Resources for Manufacturing			
Electricity	market for electricity, medium voltage electricity, medium voltage Cutoff, U - Custom SRTV 2021	Ecoinvent 3.9; SCS	2022; 2021
Natural Gas	heat production, natural gas, at industrial furnace >100kW heat, district or industrial, natural gas Cutoff, U - RoW	Ecoinvent 3.9	2022
Propane	market for propane propane Cutoff, U - GLO	Ecoinvent 3.9	2022
Diesel	market for diesel diesel Cutoff, U - RoW	Ecoinvent 3.9	2022
Water	market for tap water tap water Cutoff, U - CA-QC	Ecoinvent 3.9	2022
Transportation			
Road	transport, freight, lorry 16-32 metric ton, EURO4 transport, freight, lorry 16-32 metric ton, EURO4 Cutoff, U - RoW	Ecoinvent 3.9	2022
Ship	Transport, freight, sea, transoceanic ship {GLO} market for Alloc Rec, U	Ecoinvent 3.9	2022
Rail	market for transport, freight train transport, freight train Cutoff, U - US	Ecoinvent 3.9	2022

3.6 Data Quality

Table 6. *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	Manufacturer data (primary data) are based on 2022 annual production. Representative datasets (secondary data) used for upstream and background processes are generally less than 10 years old. All of the data used represented an average of at least one year's worth of data collection.
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. Representative data used in the assessment are representative of US, Europe, Global, or "Rest-of-World" (average for all countries in the world with uncertainty adjusted). Datasets chosen 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.
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 year and over multiple operations, which is expected to reduce the variability of results.
Completeness: Percentage of flow that is measured or estimated	Except where noted, the LCA model included all known mass and energy flows. In some instances, surrogate data used to represent upstream operations may be missing some data which is propagated in the model. No known processes or activities contributing to more than 10% 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. Some proxy datasets are used to represent materials due to the lack of data available.
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 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 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	For manufacturing and packaging, primary data were provided by Trinseo. Similarly, the upstream transport of materials is based on primary data provided by Trinseo. Where primary data were unavailable, secondary data were used. The principal source of secondary LCI data is Ecoinvent.
Uncertainty of the Information: Uncertainty related to data, models, and assumptions	Uncertainty related to the product materials and packaging is low. Data for upstream operations relied upon 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 methods required by the PCR include impact potentials, which lack characterization of providing and receiving environments or tipping points.

3.7 Period under review

The period of review is based on a 12-month period from January 2022 through December 2022.

3.8 Allocation

Resource use at the Florence, Kentucky facility (e.g., water and energy) was allocated to the product based on the product weight as a fraction of the total facility production. Impacts from transportation were allocated based on the mass of material and distance transported. No burdens are allocated across the system boundary with secondary material (Recycled acrylic chips).

3.9 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: 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. The following environmental impact category indicators are reported using characterization factors using the CML-IA impact assessment method, the TRACI 2.1 impact assessment method and the EN 15804 impact assessment method.

Table 7. *Mandatory Environmental Impact Assessment Categories.*

Impact Category	Parameter	LCIA Method	Reporting Unit (per square meter of product)
Global Warming Potential	Global warming potential	TRACI (version 2.1); CML-IA; EN 15804	kg CO ₂ eq
Acidification Potential	Acidification potential of soil and water	TRACI (version 2.1); CML-IA; EN 15804	kg SO ₂ eq; mol H ⁺ eq
Photochemical Ozone Creation Potential	Formation potential of tropospheric ozone	TRACI (version 2.1); CML-IA; EN 15804	kg O ₃ eq; kg C ₂ H ₄ eq; kg NMVOC eq
Eutrophication Potential	Eutrophication potential	TRACI (version 2.1); CML-IA; EN 15804	kg N eq; kg P ₀₄ eq
Ozone Depletion Potential	Depletion of potential of the stratospheric ozone layer	TRACI (version 2.1); CML-IA; EN 15804	kg CFC-11 eq
Depletion of Abiotic Resources (Fossil Fuels)	Abiotic depletion potential fossil resources	CML Baseline Method, Version 4.1 (October 2012)	Megajoules

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 8. *Additional Transparency Categories.*

Resources	Unit	Waste and Outflows	Unit
RPRE: Renewable primary resources used as energy carrier (fuel)	MJ, LHV	HWD: Hazardous waste disposed	kg
RPRM: Renewable primary resources with energy content used as material	MJ, LHV	NHWD: Non-hazardous waste disposed	kg
NRPRE: Non-renewable primary resources used as an energy carrier (fuel)	MJ, LHV	RWD: Radioactive waste, conditioned, to final repository	kg
NRPRM: 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	-	-

The life cycle impact assessment (LCIA) for the EPD is conducted in accordance with requirements of the PCR. All impact category indicators are estimated using TRACI 2.1, CML Baseline Method and EN 15804. The LCIA results are calculated using OpenLCA 1.11 software. Results are rounded to three significant figures.

Table 9. *LCIA results for 1 m² AVONITE using TRACI. All values are rounded to three significant digits.*

Impact Category	Units	A1	A2	A3	C1	C2	C3	C4
Acidification potential (AP)	kg SO ₂ eq	0.448	0.013	0.144	0.00	5.03x10 ⁻⁴	0.00	0.156
Global warming potential (GWP100)	kg CO ₂ eq	80.9	1.52	42.2	0.00	0.126	0.00	0.241
Eutrophication potential (EP)	kg N-Eq	0.139	0.225	0.115	0.00	1.20x10 ⁻⁴	0.00	6.45x10 ⁻⁴
Ozone depletion potential (ODP)	kg CFC-11-Eq	7.85x10 ⁻⁷	2.20x10 ⁻⁸	6.34x10 ⁻⁶	0.00	2.17x10 ⁻⁹	0.00	6.15x10 ⁻⁹
Photochemical oxidant formation potential (POCP)	kg O ₃ -Eq	4.83	0.414	2.45	0.00	1.35x10 ⁻²	0.00	0.043

Table 10. *LCIA results for 1 m² AVONITE using CML. All values are rounded to three significant digits.*

Impact Category	Units	A1	A2	A3	C1	C2	C3	C4
Acidification potential (AP)	kg SO ₂ eq	0.470	0.010	0.137	0.00	4.21x10 ⁻⁴	0.00	0.013
Global warming potential (GWP100)	kg CO ₂ eq	82.3	1.53	42.9	0.00	0.127	0.00	0.244
Eutrophication potential (EP)	kg PO ₄ eq	0.077	0.275	0.058	0.00	1.06x10 ⁻⁴	0.00	4.46x10 ⁻⁴
Ozone depletion potential (ODP)	kg CFC-11-Eq	7.59x10 ⁻⁷	1.74x10 ⁻⁸	6.06x10 ⁻⁶	0.00	1.69x10 ⁻⁹	0.00	4.74x10 ⁻⁹
Photochemical oxidation	kg C ₂ H ₄ eq	0.022	3.55x10 ⁻⁴	0.849	0.00	2.03x10 ⁻⁵	0.00	6.74x10 ⁻⁵

Table 11. LCIA results for 1 m² AVONITE using EN 15804. All values are rounded to three significant digits.

Impact Category	Units	A1	A2	A3	C1	C2	C3	C4
Acidification potential (AP)	mol H ⁺ eq	0.549	0.015	0.168	0.00	5.62x10 ⁻⁴	0.00	0.174
Global warming potential (GWP100-total)	kg CO ₂ eq	86.7	1.58	41.7	0.00	0.131	0.00	0.256
Eutrophication, freshwater	kg P eq	0.012	1.77x10 ⁻⁴	0.013	0.00	1.04x10 ⁻⁵	0.00	6.40x10 ⁻⁵
Eutrophication, marine	kg N eq	0.093	0.640	0.037	0.00	2.06x10 ⁻⁴	0.00	6.51x10 ⁻⁴
Eutrophication, terrestrial	mol N eq	0.770	0.070	0.384	0.00	0.221	0.00	0.696
Ozone depletion	kg CFC-11-Eq	7.67x10 ⁻⁷	2.01x10 ⁻⁸	6.19x10 ⁻⁶	0.00	2.02x10 ⁻⁹	0.00	5.76x10 ⁻⁹
Photochemical ozone formation	kg NMVOC eq	0.329	0.020	0.184	0.00	7.57x10 ⁻⁴	0.00	0.235

Table 12. Resource use results for 1 m² of AVONITE.

Parameter	Units	A1	A2	A3	C1	C2	C3	C4
Use of renewable primary energy excluding the renewable primary energy resources used as raw materials [PERE]	MJ	15.5	0.499	112	0.00	0.023	0.00	0.090
Use of renewable primary energy resources used as raw materials [PERM]	MJ	0.00	0.00	42.7	0.00	0.00	0.00	0.00
Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials [PENRE]	MJ	1,230	19.3	1,260	0.00	1.81	0.00	5.29
Use of non-renewable primary energy resources used as raw materials [PENRM]	MJ	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Use of secondary materials [SM]	kg	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Use of renewable secondary fuels [RSF]	MJ	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Use of non-renewable secondary fuels [NRSF]	MJ	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Net use of freshwater resources [FW]	m ³	0.388	0.315	0.032	0.00	2.28x10 ⁻⁴	0.00	0.538
Recovered energy [RE]	MJ	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Abiotic depletion (fossil fuels)	MJ	1,160	18.9	1,170	0.00	1.79	0.00	5.17

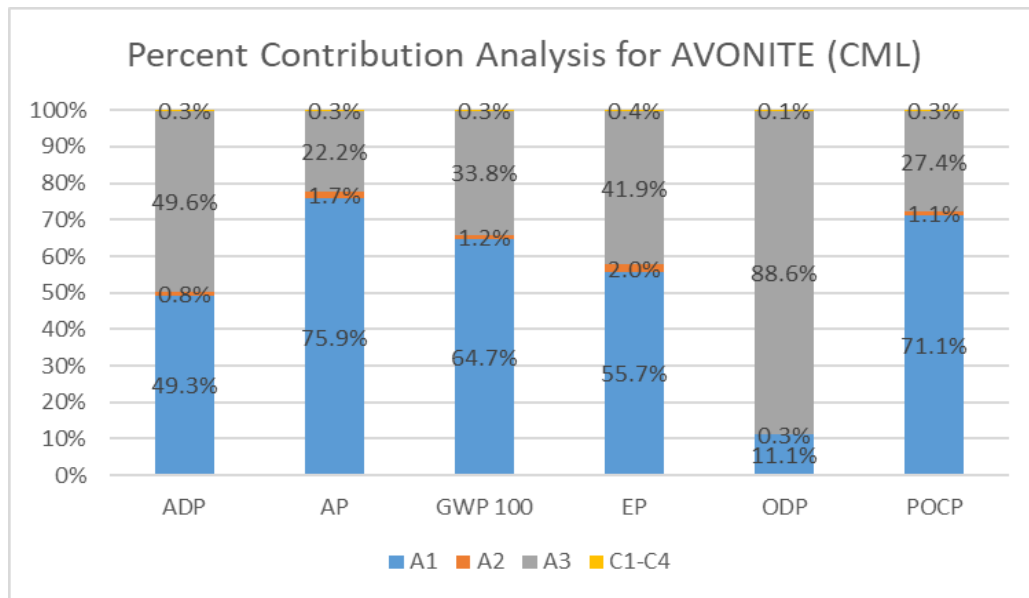
Table 13. Waste and outflows for 1 m² of AVONITE.

Parameter	Units	A1	A2	A3	C1	C2	C3	C4
Hazardous waste disposed [HWD]	kg	0.00	0.00	0.145	0.00	0.00	0.00	0.00
Non-hazardous waste disposed [NHWD]	kg	0.00	0.00	2.66	0.00	0.00	0.00	20.8
High level radioactive waste (HRWD)	kg	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Intermediate and low level radioactive waste (ILRWD)	kg	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Components for re-use [CRU]	kg	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Materials for recycling [MFR]	kg	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Materials for energy recovery [MER]	kg	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Exported energy [EE]	MJ	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Use of renewable material resources [RMR]	kg	0.00	0.00	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.

Generally speaking, for the AVONITE product system and the indicators included in this study, the contribution to impacts from the raw material extraction and processing stage is the largest, primarily from the production of methyl methacrylate. The percent contribution of each relevant life cycle stage for each impact category is presented below in Figure 5, using CML LCIA results. The results of the dominance analysis are reported for the CML-IA. Similar results are received using TRACI 2.1 and the EN 15804 impact assessment method.

**Figure 2.** Percent contribution analysis chart for AVONITE™.

7. ADDITIONAL ENVIRONMENTAL INFORMATION



The AVONITE™ product line is certified Indoor Advantage Gold™ by SCS Global Services (SCS-IAQ-04802), which conforms to the CDPH/EHLB Standard Method (CA 01350) v1.2-2017. The measured concentration of total volatile organic compounds (TVOC) less than or equal to 0.5 mg/m³.



Several AVONITE™ products are certified Recycled Content™ by SCS Global Services (SCS-MC-02224), which conforms to SCS Recycled Content Standard v7-0, for an average minimum 16% pre-consumer recycled polymer content. The material quantification is calculated by a mass-balance on a dry-weight basis.



The AVONITE™ product line is certified NSF/ANSI 51 by NSF International (Certificate #: 02931-02), which establishes the minimum health and sanitation requirements for materials used in the making of commercial food equipment. The product line materials were assessed, for use only as a table or countertop, to not contaminate all food contact types with a maximum temperature of use of 300 °F.

The AVONITE™ product line is represented by a self-declared Health Product Declaration, prepared in accordance to the Health Product Declaration® Open Standard, Version 1.0 (December 15, 2012). The content of the product was assessed for health hazard warning as required using MSDS (1,000 & 10,000 ppm). This product is pending an updated HPD in conformance to the Health Product Declaration® Open Standard, Version 2.1 (May 1, 2017). The updated HPD is planned to undergo a third-party verification upon completion.

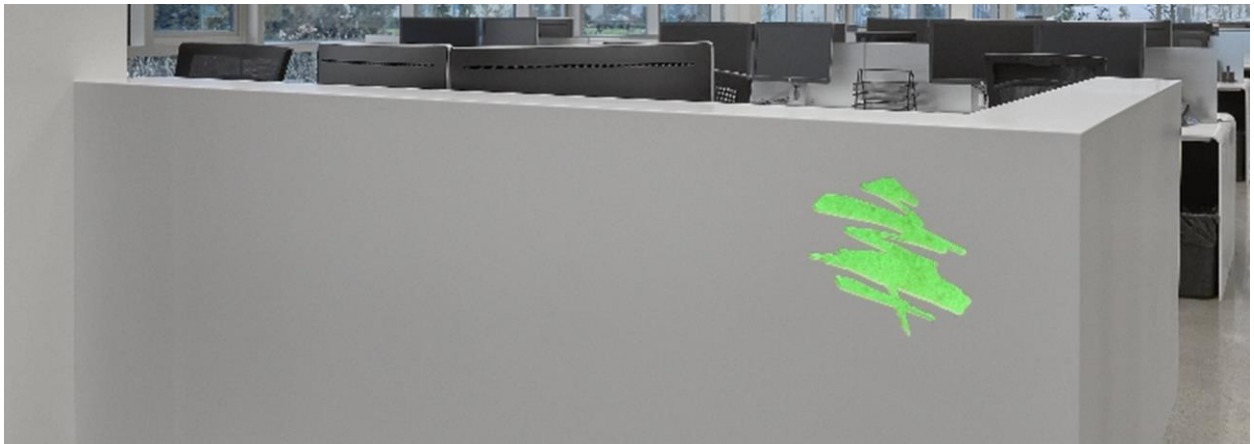
For more information and to access all certifications and sustainability initiatives, please visit:

<https://aristechs-surfaces.com/market/architectural/avonite/resources>



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For more information please contact:



Trinseo

7350 Empire Drive, Florence, Kentucky 41042
+1.800.354.9858
info@trinseo.com; aristechnfo@trinseo.com
www.trinseo.com; www.aristechsurfaces.com



SCS Global Services

2000 Powell Street, Ste. 600, Emeryville, CA 94608 USA
Main +1.510.452.8000 | fax +1.510.452.8001