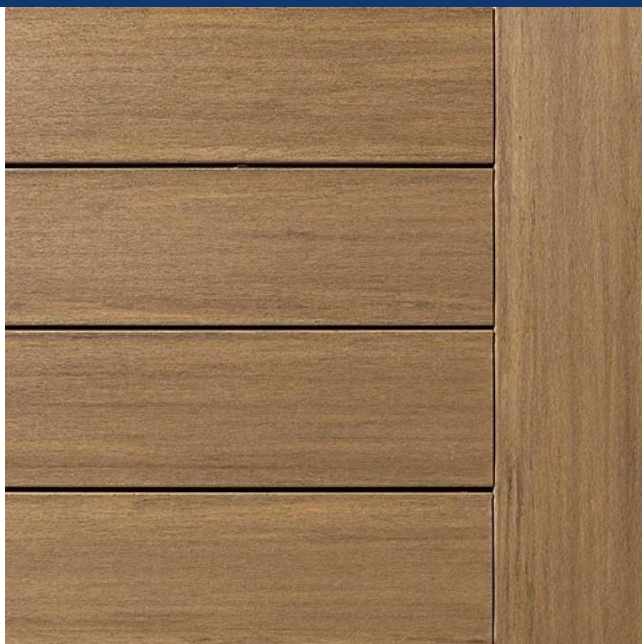


ENVIRONMENTAL PRODUCT DECLARATION

IN ACCORDANCE WITH ISO 14025:2006 AND ISO 21930:2017

SmartEPD-2025-070-0492-01

TimberTech Advanced Polyvinyl Chloride (PVC) Decking



Date of Issue:	Expiration:	Last updated:
Jun 12, 2025	Jun 12, 2030	Jun 12, 2025

Refer to the EPD Library at www.smartepd.com for the latest EPD listing information



General Information

The AZEK Company

1330 W Fulton Street Suite #350, Chicago, IL 60607

877-275-2935

adam.ouziel@azekco.com

azekco.com



Product Name:	TimberTech Advanced Polyvinyl Chloride (PVC) Decking
Functional Unit:	1 m2 installed flooring
Declaration Number:	SmartEPD-2025-070-0492-01
Date of Issue:	June 12, 2025
Expiration:	June 12, 2030
Last updated:	June 12, 2025
EPD Scope:	Cradle to grave A1 - A3, A4, A5, B1 - B7, C1 - C4, D
Market(s) of Applicability:	North America

General Organization Information

The AZEK Company (AZEK) is a renowned decking manufacturer committed to innovating, inspiring, reinventing, revolutionizing and leading the industry to create a more sustainable future. The company offers low-maintenance, beautiful outdoor living products that combine innovations in material science with performance and beauty to offer their customers world-class, environmentally sustainable solutions.

Limitations, Liability and Ownership

The EPD owner has sole ownership, liability, and responsibility for the EPD.

Environmental declarations from different programs (ISO 14025) may not be comparable. Comparison of the environmental performance of products using EPD information shall be based on the product's use and impacts at the building or construction works level, and therefore EPDs may not be used for comparability purposes when not considering the whole building life cycle. EPD comparability is only possible when all stages of a life cycle have been considered. However, variations and deviations are possible. Example of variations: Different LCA software and background LCI datasets may lead to differences in results upstream or downstream of the life cycle stages declared.

The environmental impact results of products in this document are based on a declared unit and therefore do not provide sufficient information to establish comparisons. The results shall not be used for comparisons without knowledge of how the physical properties of the product impact the precise function at the construction level. The environmental impact results shall be converted to a functional unit basis before any comparison is attempted.

Reference Standards

Standard(s):	ISO 14025:2006 and ISO 21930:2017
Core PCR:	UL Part A PCR for Building-Related Products and Services v.4 Date of issue: March 01, 2022
Sub-category PCR:	UL Part B: Flooring v.2

Date of issue: September 28, 2018

Valid until: July 31, 2025

Sub-category PCR review panel:

📄 Contact Smart EPD for more information.

General Program Instructions:

📄 Smart EPD General Program Instructions v.2.0, March 2025

Verification Information

LCA Author/Creator:

🌐 Martin Grohman
✉ martin.grohman@azekco.com

EPD Program Operator:

📄 Smart EPD
✉ info@smartepd.com
🌐 www.smartepd.com
📍 585 Grove St., Ste. 145, Herndon, VA 20170, USA

Verification:

Independent critical review of the LCA and data, according to ISO 14044 and ISO 14071:

🌐 Lucas Pedro Berman | 📄 Senda - Consultoria Ambiental & Energetica |
✉ info@sendaconsultorias.com

External

Independent external verification of EPD, according to ISO 14025 and reference PCR(s):

🌐 Lucas Pedro Berman | 📄 Senda - Consultoria Ambiental & Energetica |
✉ info@sendaconsultorias.com

External

Product Information

Functional Unit:

1 m2 installed flooring

Mass:

15.2 kg

Reference Service Life:

50 Years

Product Specificity:

✗ Product Average
✓ Product Specific

Variation in GWP Result (Facilities):

-45.24%% to 14.84%%

Product Description

TimberTech PVC decking board is manufactured mainly from recycled and virgin polyvinylchloride (PVC) in combination with secondary ingredients that increase performance, appearance and longevity. The PVC decking is covered by a 50-year manufacturer warranty.

Further information can be found at: <https://www.timbertech.com/about-warranties/>

Product Specifications

Product Classification Codes:

Masterformat - SECTION 067300 - COMPOSITE DECKING

Product Composition Diagram



Material Composition

Material/Component Category	Origin	% Mass
Virgin PVC	None	30
Recycled PVC	None	55
Other Materials	None	15

Packaging Material	Origin	kg Mass
Corner Boards	None	1.06E-01
Plywood Sheets	None	8.03E-03
PET	None	1.07E-02

Packaging Material	Origin	kg Mass
Unit Covers	None	2.10E-02
Wood Dunnage	None	2.86E-01

Biogenic Carbon Content	kg C per m2 installed flooring
Biogenic carbon content in product	50.8
Biogenic carbon content in accompanying packaging	0.649

Hazardous Materials
No regulated hazardous or dangerous substances are included in this product.

EPD Data Specificity

Primary Data Year:	2023
Manufacturing Specificity:	✗ Industry Average ✓ Manufacturer Average ✗ Facility Specific

Averaging:
The composite decking represents manufacturing averages from three AZEK facilities (Wilmington, Ohio; Boise, Idaho; and Scranton, Pennsylvania in the US). The EPD was based on the weighted average of the product output of each facility.

System Boundary

Production	A1	Raw material supply	✓
	A2	Transport	✓
	A3	Manufacturing	✓
Construction	A4	Transport to site	✓
	A5	Assembly / Install	✓
Use	B1	Use	✓
	B2	Maintenance	✓
	B3	Repair	✓
	B4	Replacement	✓
	B5	Refurbishment	✓
	B6	Operational Energy Use	✓
	B7	Operational Water Use	✓

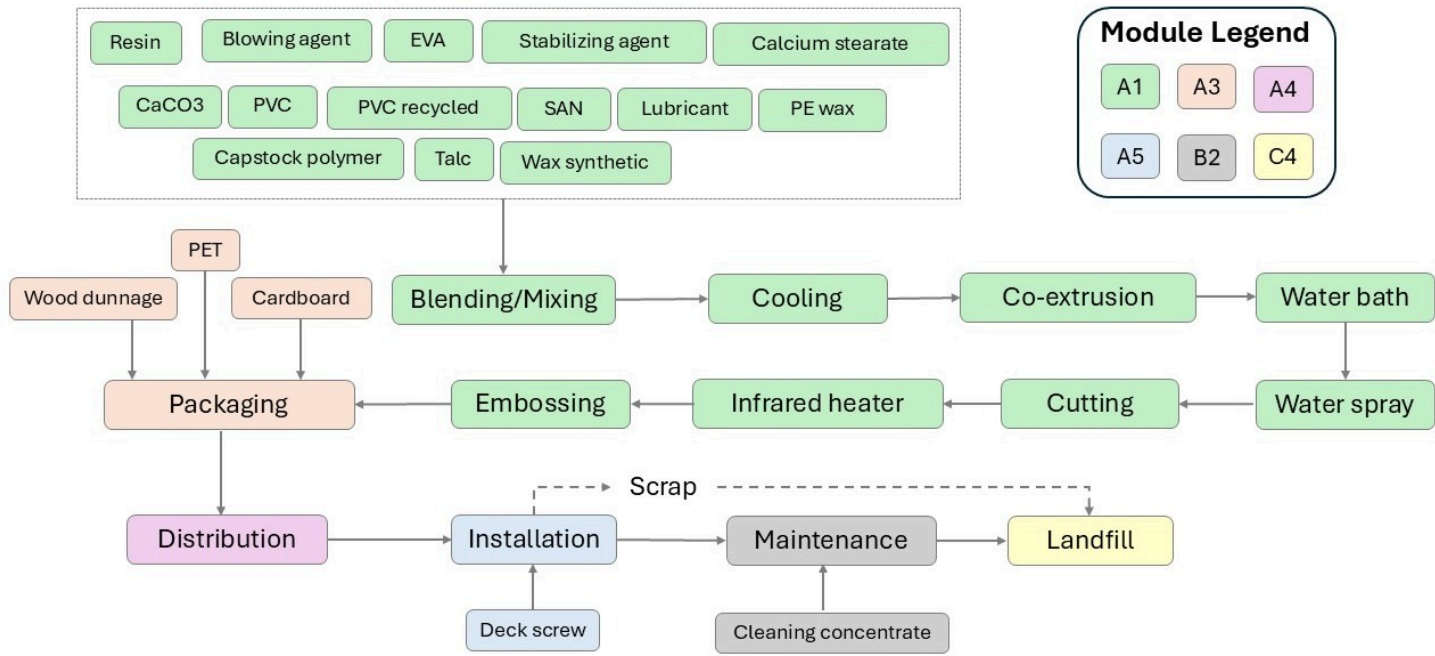
End of Life	C1	Deconstruction	✓
	C2	Transport	✓
	C3	Waste Processing	✓
	C4	Disposal	✓
Benefits & Loads Beyond System Boundary	D	Recycling, Reuse Recovery Potential	✓

Note:
ND = Module not declared

Plants

-  AZEK Company 1001 E Gowen Rd, Boise, ID 83716, United States
-  AZEK Building Products 894 Prairie Rd, Wilmington, OH 45177, United States
-  AZEK Building Products 888 N Keyser Ave, Scranton, PA 18504, United States

Product Flow Diagram



Software And Database

- LCA Software:
 -  Sphera LCA for Experts (formerly GaBi) v. 10.9
- LCI Foreground Database(s):
 -  Managed LCA Content v. 2025.1
- LCI Background Database(s):
 -  Managed LCA Content v. 2025.1

A foreground LCI database is the database used to model the primary, site-specific data collected for this EPD. A background LCI database is the database used to model generic or non-specific data.

Data Quality

To cover these requirements and to ensure reliable results, first-hand industry data in combination with consistent background LCA information from LCA for Experts 2025.1 database were used. The LCI datasets from the Managed LCA Content 2025.1 database are widely distributed and used with the LCA for Experts Software. The datasets have been used in LCA models worldwide, in industrial and scientific applications internal as well as in many critically reviewed and published studies. In the process of providing these datasets they are cross-checked with other databases and values from industry and science.

Life Cycle Module Description

Module A1 to A3:

The product stage includes provision of all materials, products and energy, as well as waste processing up to the end-of waste state or disposal of final residues during the product stage.

These modules consider the manufacturing of system components/raw materials in the particular decking, the transport to the production site and the assembly of the product under study. The impact of packaging materials is also included.

Module A4:

The module considers 800 km truck transport to installation site.

Module A5:

Installation in the building; includes the provision of necessary installation materials (e.g., screws) and energy such as electricity. The waste processing of packaging materials is also considered in A5. The installation auxiliaries end of life is considered in the EOL module C4.

Module B1 to B7:

While all the modules in the use stage are declared, only B2 (Maintenance) is considered to have any emissions or resource use associated with it. The other modules will have no relevant effects on the results or are not applicable at all (e.g., B6 and B7).

Module B2: Maintenance; includes cleaning the decks. Electricity, water, and detergents are considered as well as the waste treatment of the used water and detergent.

Module C1 to C4:

The end-of-life stage includes the following modules:

Module C2: Transport to waste processing.

Module C3: Waste processing for reuse, recovery and/or recycling (C3=0%)

Module C4: Disposal (C4=100%)

Each module includes transport, provision of materials, and related energy and water use. The end-of-life scenarios for the packaging and product include landfilling as plastic and wood waste on landfill. Module C1 is assumed to have negligible impacts because deconstruction is assumed to be done manually.

Module D:

Deckings are assumed to reach the end of waste status directly at construction sites. The treatment and credits for avoided primary production (for the Full Circle recycling program) are grouped to module D.

LCA Discussion

Allocation Procedure

No co-product or by-product allocation was necessary during the manufacturing, use, or end of life stages in the foreground model. Allocation of background data (energy and materials) taken from Sphera's Managed LCA Content (MLC) 2025.1 databases is documented online at <https://lcadatabase.sphera.com>.

Cut-off Procedure

In this study, the cut-off approach is used at EoL.

Material recycling (cut-off approach): Any open scrap inputs into manufacturing remain unconnected. The system boundary at end of life is drawn after scrap collection to account for the collection rate, which generates an open scrap output for the product system. The processing and recycling of the scrap is associated with the subsequent product system and is not considered in this study.

Energy recovery & landfilling (cut-off approach): Any open scrap inputs into manufacturing remain unconnected. The system boundary includes the waste incineration and landfilling processes following the polluter-pays-principle. In cases where materials are sent to waste incineration, they are linked to an inventory that accounts for waste composition and heating value as well as for regional efficiencies and heat-to-power output ratios. In cases where materials are sent to landfills, they are linked to an inventory that accounts for waste composition, regional leakage rates, landfill gas capture as well as utilization rates (flaring vs. power production). No credits for power or heat production are assigned.

Renewable Electricity

Energy Attribute Certificates (EACs) such as Renewable Energy Certificates (RECs) or Power Purchase Agreements (PPAs) are included in the baseline reported results:	✓ Yes
Electricity Source:	Offsite
Renewable type(s):	Nuclear
Percent of EPD Owner's product-related electricity covered:	73.93% %
Grid type used to model remaining electricity:	26.07%
Commitment pledged for entire EPD validity period:	✓ Yes
Electricity accounting methodology:	Market-based

Scenarios

Transport to the building/construction site (A4)

A4 Module

Fuel Type:	Diesel
Liters of Fuel:	2.21 l/100km
Vehicle Type:	Truck
Transport Distance:	800 km
Capacity Utilization:	75 %
Packaging Mass:	35.07 kg
Capacity utilization volume factor:	=1

Installation in to the building/construction site (A5)

A5 Module

Installation Scrap Rate Assumed:	5 %
Ancillary Materials:	1.86E-01 kg
Electricity Consumption:	0.019388 kWh

Product Lost per Declared/Functional Unit:	7.99E-01 kg
Waste Materials at the Construction Site Before	1.23E+00 kg
Waste Processing:	
Mass of Packaging Waste Specified by Type:	4.31E-01 kg

Use (B1)

B1 Module

Design Application Parameters:

Installation as per manufacturer's recommendations

An Assumed Quality of Work, When Installed in Accordance with The Manufacturer's Instructions:

Accepted industry standard

Outdoor Environment:

Normal outdoor operating conditions

Indoor Environment:

-

Use Conditions:

Normal outdoor operating conditions

Maintenance:

Maintenance based on manufacturer's recommendations(Starting one year after installation, an annual cleaning is performed with TimberTech deck cleaner and water, using a scrub brush)

Maintenance (B2)

B2 Module

Maintenance Cycle:	49 Cycles/RSL
Net Fresh Water Consumption Specified by Water	0.122 m3
Source and Fate:	
Ancillary Materials Specified by Type:	2.00E+00 kg
Maintenance Process Information:	Starting one year after installation, an annual cleaning is performed with TimberTech deck cleaner and water, using a scrub brush.

Replacement (B4)

B4 Module

Reference Service Life:	50 Years
Replacement Cycle:	0.5 (ESL/RSL)-1

End of Life (C1 - C4)

C1 - C4 Modules

Collection Process

Collected with Mixed Construction Waste:	1.52E+01 kg
--	-------------

Recovery

Landfill:	1.52E+01 kg
-----------	-------------

Results

Environmental Impact Assessment Results

IPCC AR5 GWP 100, TRACI 2.1

per 1 m2 installed flooring of product.

LCIA results are relative expressions and do not predict impacts on category endpoints, the exceeding of thresholds, safety margins or risks.

Impact Category	Unit	Method	A1 - A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
GWP-total	kg CO2 eq	IPCC AR5 GWP 100	2.47e+1	7.99e-1	7.83e-1	0	1.46e+0	0	1.41e+1	0	0	0	0	1.27e-1	0	3.49e-1	0
ODP	kg CFC 11 eq	TRACI 2.1	8.46e-11	2.35e-13	6.42e-12	0	1.17e-13	0	4.62e-11	0	0	0	0	3.53e-14	0	1.03e-12	0
AP	kg SO2 eq	TRACI 2.1	4.51e-2	3.22e-3	4.73e-3	0	5.57e-3	0	3.04e-2	0	0	0	0	5.33e-4	0	1.74e-3	0
EP	kg N eq	TRACI 2.1	3.13e-2	2.97e-3	8.87e-4	0	1.90e-3	0	1.92e-2	0	0	0	0	4.93e-4	0	8.67e-4	0
POCP	kg O3 eq	TRACI 2.1	9.92e-1	7.38e-2	3.09e-2	0	6.73e-2	0	6.04e-1	0	0	0	0	1.22e-2	0	3.11e-2	0
ADP-fossil	MJ	TRACI 2.1	4.32e+2	1.06e+1	8.35e+0	0	3.96e+1	0	2.49e+2	0	0	0	0	1.59e+0	0	4.98e+0	0

Note:

Not all abbreviated indicators listed below may be present in the results above. The inclusion of indicators varies based on PCR requirements.

Abbreviations:

GWP = Global Warming Potential, 100 years (may also be denoted as GWP-total, GWP-fossil (fossil fuels), GWP-biogenic (biogenic sources), GWP-luluc (land use and land use change)), ODP = Ozone Depletion Potential, AP = Acidification Potential, EP = Eutrophication Potential, SFP = Smog Formation Potential, POCP = Photochemical oxidant creation potential, ADP-Fossil = Abiotic depletion potential for fossil resources, ADP-Minerals&Metals = Abiotic depletion potential for non-fossil resources, WDP = Water deprivation potential, PM = Particular Matter Emissions, IRP = Ionizing radiation, human health, ETP-fw = Eco-toxicity (freshwater), HTP-c = Human toxicity (cancer), HTP-nc = Human toxicity (non-cancer), SQP = Soil quality index.

Comparisons cannot be made between product-specific or industry average EPDs at the design stage of a project, before a building has been specified. Comparisons may be made between product-specific or industry average EPDs at the time of product purchase when product performance and specifications have been established and serve as a functional unit for comparison. Environmental impact results shall be converted to a functional unit basis before any comparison is attempted. Any comparison of EPDs shall be subject to the requirements of ISO 21930 or EN 15804. EPDs are not comparative assertions and are either not comparable or have limited comparability when they have different system boundaries. EPDs are not comparative assertions and are either not comparable or have limited comparability when they have different system boundaries, are based on different product category rules or are missing relevant environmental impacts. Such comparison can be inaccurate, and could lead to erroneous selection of materials or products which are higher-impact, at least in some impact categories.

Resource Use Indicator

per 1 m2 installed flooring of product.

Indicator	Unit	A1 - A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
PERE	MJ, net calorific value	7.24e+1	4.44e-1	2.42e+0	0	1.32e+0	0	3.87e+1	0	0	0	0	6.68e-2	0	7.30e-1	0
PERM	MJ, net calorific value	4.35e+0	0	0	0	0	0	2.18e+0	0	0	0	0	0	0	0	0
PERT	MJ, net calorific value	7.67e+1	4.44e-1	2.42e+0	0	1.32e+0	0	4.09e+1	0	0	0	0	6.68e-2	0	7.30e-1	0
PENRE	MJ, net calorific value	4.16e+2	1.07e+1	9.13e+0	0	4.11e+1	0	2.42e+2	0	0	0	0	1.61e+0	0	5.14e+0	0
PENRM	MJ, net calorific value	2.40e+2	0	0	0	0	0	1.20e+2	0	0	0	0	0	0	0	0
PENRT	MJ, net calorific value	6.55e+2	1.07e+1	9.13e+0	0	4.11e+1	0	3.61e+2	0	0	0	0	1.61e+0	0	5.14e+0	0
SM	kg	8.52e+0	0	0	0	0	0	4.26e+0	0	0	0	0	0	0	0	0
RSF	MJ, net calorific value	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NRSF	MJ, net calorific value	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
RE	MJ	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
FW	m3	1.93e-1	4.79e-4	3.53e-3	0	1.35e-1	0	1.67e-1	0	0	0	0	7.21e-5	0	5.59e-4	0

Note:

Not all abbreviated indicators listed below may be present in the results above. The inclusion of indicators varies based on PCR requirements.

Abbreviations:

RPRE or PERE = Renewable primary resources used as energy carrier (fuel), RPRM or PERM = Renewable primary resources with energy content used as material, RPRT or PERT = Total use of renewable primary resources with energy content, NRPRE or PENRE = Non-renewable primary resources used as an energy carrier (fuel), NRPRM or PENRM = Non-renewable primary resources with energy content used as material, NRPRT or PENRT = Total non-renewable primary resources with energy content, SM = Secondary materials, RSF = Renewable secondary fuels, NRSF = Non-renewable secondary fuels, RE = Recovered energy, ADPF = Abiotic depletion potential, FW = Use of net freshwater resources, VOCs = Volatile Organic Compounds.

Waste and Output Flow Indicators

per 1 m2 installed flooring of product.

Indicator	Unit	A1 - A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
HWD	kg	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NHWD	kg	3.32e-1	0	0	0	0	0	8.36e+0	0	0	0	0	0	0	1.64e+1	0
HLRW	kg	9.44e-5	4.36e-8	2.83e-7	0	8.81e-7	0	4.78e-5	0	0	0	0	6.56e-9	0	6.43e-8	0
ILLRW	kg	7.93e-2	3.66e-5	2.76e-4	0	5.83e-4	0	4.01e-2	0	0	0	0	5.51e-6	0	5.65e-5	0
CRU	kg	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
MFR	kg	6.69e-3	0	1.24e-2	0	0	0	9.53e-3	0	0	0	0	0	0	0	0
MER	kg	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Note:

Not all abbreviated indicators listed below may be present in the results above. The inclusion of indicators varies based on PCR requirements.

Abbreviations:

HWD = Hazardous waste disposed, NHWD = Non-hazardous waste disposed, RWD = Radioactive waste disposed, HLRW = High-level radioactive waste, ILLRW = Intermediate- and low-level radioactive waste, CRU = Components for re-use, MFR or MR = Materials for recycling, MER = Materials for energy recovery, MNER = Materials for incineration, no energy recovery, EE or EEE = Recovered energy exported from the product system, EET = Exported thermal energy.

Carbon Emissions and Removals

per 1 m2 installed flooring of product.

Indicator	Unit	A1 - A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
BCRP	kg CO2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
BCEP	kg CO2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
BCRK	kg CO2	4.33e-1	0	0	0	0	0	2.16e-1	0	0	0	0	0	0	0	0
BCEK	kg CO2	0	0	4.33e-1	0	0	0	2.16e-1	0	0	0	0	0	0	0	0
BCEW	kg CO2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CCE	kg CO2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CCR	kg CO2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CWNR	kg CO2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Note:



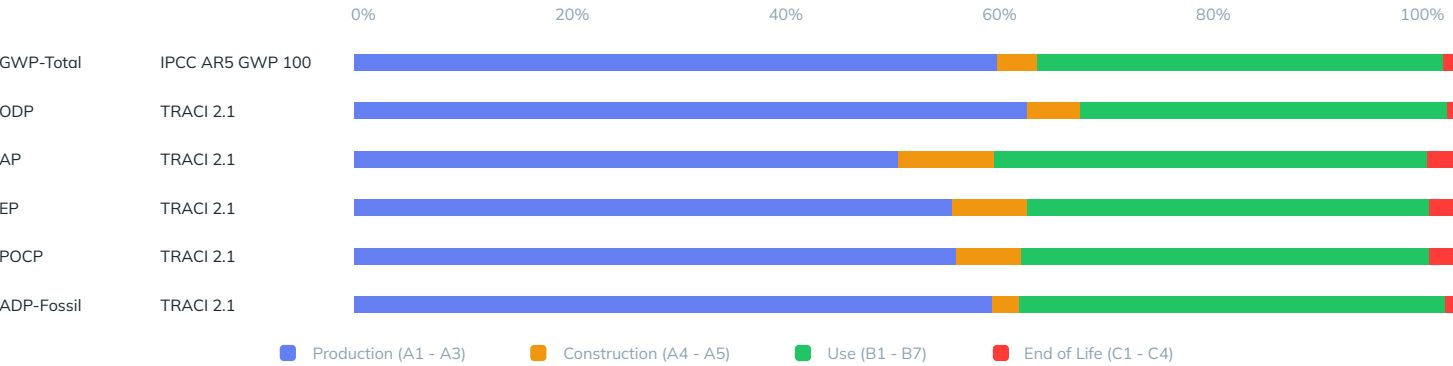
Not all abbreviated indicators listed below may be present in the results above. The inclusion of indicators varies based on PCR requirements.

Abbreviations:

BCRP = Biogenic Carbon Removal from Product, BCEP = Biogenic Carbon Emission from Product, BCRK = Biogenic Carbon Removal from Packaging, BCEK = Biogenic Carbon Emission from Packaging, BCEW = Biogenic Carbon Emission from Combustion of Waste from Renewable Sources Used in Production Processes, CCE = Calcination Carbon Emissions, CCR = Carbonation Carbon Removals, CWNR = Carbon Emissions from Combustion of Waste from Non-Renewable Sources used in Production Processes, GWP-luc = Carbon Emissions from Land-use Change.

Interpretation

The primary drivers of the individual environmental burdens are consistently raw materials and the replacement of the decking over ESL of 75 years. Replacements account for 33% of total contribution across all the impact indicators. Raw Materials (A1) accounts for 38% of GWP, 41% ODP, 42% ADP_f, and between 22% and 26% for EP, AP and SFP. Transport (A2) has a higher contribution across AP at 17%, EP at 24%, and SFP at 21%. Manufacturing (A3) shows a 9% contribution to GWP, 16% to ODP, 6% to SFP, 7% to ADP_f, and 5% to AP and EP. Installation (A5) of decking product contributes between 4% and 8% across all impact categories.



Other Environmental Impacts

Impact Category	Unit	Method	A1 - A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
GWP-GHG	kg CO2 eq	IPCC AR5 GWP 100	5.25e-2	4.38e-4	8.80e-4	0	9.12e-4	0	2.75e-2	0	0	0	0	6.60e-5	0	2.24e-4	0

Note:

Abbreviations:

GWP-IOBC/GWP-GHG = Climate change indicator with instantaneous oxidation of biogenic carbon. The GWP-IOBC indicator has zero contribution to GWP from biogenic carbon temporary stored in products and packaging. The GWP-IOBC indicator, also called GWP-GHG, is identical to GWP-total except that the characterization factor (CF) for biogenic CO2 is set to zero.

Environmental Activities and Certifications

Certification
Full Circle Recycling Program

References

Bare, J. (2012). *Tool for the Reduction and Assessment of Chemical and other Environmental Impacts (TRACI) - Software Name and Version Number: TRACI version 2.1 - User's Manual*. Washington, D.C.: U.S. EPA.

BSI. (2012). *PAS 2050-1:2012: Assessment of life cycle greenhouse gas emissions from horticultural products*. London: British Standards Institute.

CRI. (2016). *CRI 204 Commercial Carpet Standard for Maintenance and Cleaning*. CRI.

EPA. (2012). *Tool for the Reduction and Assessment of Chemical and other Environmental Impacts (TRACI) - User's Manual*. Washington, D.C.: U.S. EPA.

Graedel, T., & Reck, B. (2015). Six Years of Criticality Assessments - What Have We Learned So Far? *Journal of Industrial Ecology*. doi:10.1111/jiec.12305

Guinée, J. B., Gorée, M., Heijungs, R., Huppes, G., Kleijn, R., de Koning, A., . . . Huijbregts, M. (2002). *Handbook on life cycle assessment. Operational guide to the ISO standards*. Dordrecht: Kluwer.

IPCC. (2006). *2006 IPCC Guidelines for National Greenhouse Gas Inventories - Volume 4 - Agriculture, Forestry and Other Land Use*. Geneva, Switzerland: IPCC.

IPCC. (2013). *Climate Change 2013: The Physical Science Basis*. Geneva, Switzerland: IPCC.

IPCC. (2013). *Climate Change 2013: The Physical Science Basis*. Genf, Schweiz: IPCC.

ISO. (2006). *ISO 14025: Environmental labels and declarations - Type III environmental declarations - principles and procedures*.

- ISO. (2006). *ISO 14040: Environmental management – Life cycle assessment – Principles and framework*. Geneva: International Organization for Standardization.
- ISO. (2006). *ISO 14044: Environmental management – Life cycle assessment – Requirements and guidelines*. Geneva: International Organization for Standardization.
- ISO. (2017). *ISO 21930: Sustainability in buildings and civil engineering works - Core rules for environmental product declarations of construction products and services*.
- JRC. (2010). *ILCD Handbook: General guide for Life Cycle Assessment – Detailed guidance. EUR 24708 EN* (1st ed.). Luxembourg: Joint Research Centre.
- Nassar, N., Barr, R., Browning, M., Diao, Z., Friedlander, E., Harper, E., . . . Graedel, T. (2012). Criticality of the Geological Copper Family. *Environmental Science & Technology*, 1071-1078.
- Pfister, S., Koehler, A., & Hellweg, S. (2009). Assessing the Environmental Impacts of Freshwater Consumption in LCA. *Environ. Sci. Technol.*, 43(11), 4098–4104.
- Rosenbaum, R. K., Bachmann, T. M., Swirsky Gold, L., Huijbregts, M., Joliet, O., Juraske, R., . . . Hauschild, M. Z. (2008). USEtox—the UNEP-SETAC toxicity model: recommended characterisation factors for human toxicity and freshwater ecotoxicity in life cycle impact assessment. *Int J Life Cycle Assess*, 13(7), 532–546.
- Smart EPD. (2024). *PART A PRODUCT CATEGORY RULES FOR BUILDING AND CONSTRUCTION PRODUCT AND SERVICES*. Smart EPD.
- Sphera. (2020). *Comparative LCA of Three Decking Materials*. AZEK Building Products.
- Sphera Solutions Inc. (2025). *LCA FE LCA Database*. Retrieved from sphera: <https://lcadatabase.sphera.com/>
- UL Environment. (2018). *Product Category Rule (PCR) Guidance for Building-Related Products and Services, Part B: Flooring EPD Requirements; UL 10010-7*. UL Environment.
- UL Environment. (2018). *Product Category Rules for Building-Related Products and Services - Part A: Life Cycle Assessment Calculation Rules and Report Requirements, v4.0* Updated to provide conformance pathway with EN 15804:A2 28.03.2022
- ULE. (2018). *Part B: Flooring EPD Requirement v 2.0*. UL Environment.
- WRI. (2011). *GHG Protocol Product Life Cycle Accounting and Reporting Standard*. Washington D.C.: World Resource Institute.