

ENVIRONMENTAL PRODUCT DECLARATION

IN ACCORDANCE WITH EN 15804+A2 & ISO 14025 / ISO 21930

ACOUSTIC SILENCE 1050

SCAN UNDERLAY

Programme:
The International EPD®
System,
www.environdec.com

Programme operator:
EPD International AB

EPD registration
number:
S-P-09701

Publication
date:
2023-06-29

Valid until:
2028-06-26

Geographical
scope:
EU

An EPD should provide current information and may be updated if conditions change. The stated validity is therefore subject to the continued registration and publication at www.environdec.com.



GENERAL INFORMATION

MANUFACTURER INFORMATION

Manufacturer	Scan Underlay
Address	Ursusvej 16, 8464 Galten, Denmark
Contact details	hello@scanunderlay.com
Website	https://scanunderlay.com/

PRODUCT IDENTIFICATION

Product name	Acoustic Silence 1050
Additional label(s)	Acoustic Silence 50, Acoustic Silence 100, Acoustic Silence 125, Acoustic Silence 250, Acoustic Silence 500
Product number / reference	1050
Place(s) of production	Bizonvej 2, 8464 Galten, Denmark
CPC code	362 - Other rubber products

The International EPD System

EPDs within the same product category but from different programmes may not be comparable.

EPD INFORMATION

The EPD owner has the sole ownership, liability, and responsibility for the EPD. Construction products EPDs may not be comparable if they do not comply with EN 15804 and if they are not compared in a building context.

EPD program operator	The International EPD System
EPD standards	This EPD is in accordance with EN 15804+A2, ISO 14025 standards and ISO 21930.
Product category rules	The CEN standard EN 15804 serves as the core PCR. In addition, the Int'l EPD System PCR 2019:14 Construction products, version 1.11 (05.02.2021) is used. Product specific complementary category rules have not been applied in this EPD
EPD author	Christian Hansen, Scan Underlay
EPD verification	Independent verification of this EPD and data, according to ISO 14025: <input type="checkbox"/> Internal certification <input checked="" type="checkbox"/> External verification
Verification date	2023-06-26
EPD verifier	Sergio A. Ballén Zamora
EPD number	S-P-09701
ECO Platform nr.	-
Publishing date	2023-06-29
EPD valid until	2028-06-26

PRODUCT INFORMATION

PRODUCT DESCRIPTION

Acoustic Silence 1050 is available in a full roll of 1-meter width, while Acoustic Stripes are available in narrower widths of 50, 100, 125, 250, and 500 mm. Both products are made of upcycled rubber from used car tires, produced using renewable energy sources. They provide exceptional durability and long-lasting performance, are easy to install and maintain, and are eco-friendly and sustainable solutions for noise reduction that meet PAHs and Reach regulations. They are suitable for use in DGNB-certified buildings and designed to reduce impact noise transmission in inter-floor and inter-room applications, creating a comfortable and peaceful environment for building inhabitants.

PRODUCT APPLICATION

Acoustic sound insulation is used in inter-floor and inter-room applications to mitigate the transmission of impact-induced vibrations. It is applied to decrease the audibility of footfall and other impact noise, which can be disruptive and bothersome in multi-level and multi-room buildings, by reducing the noise transmission to lower floors and neighboring rooms, thereby increasing privacy and comfort for residents and employees. Additionally, it can aid in increasing the overall sound isolation of the building and reducing noise from foot traffic and other walking-related activities.

TECHNICAL SPECIFICATIONS

Impact-sound reduction: $\Delta L_w \geq 21$ dB

Dynamic stiffness: $S \leq 103$ MN/m³

Compressive strength: 5 kPa

*Please note that the technical properties outlined in this report are based on current production methods and may be subject to improvement through optimization and advancements in techniques. Any such modifications will not affect the validity or accuracy of the provided Environmental Product Declaration (EPD).

PRODUCT STANDARDS

- EN ISO 10140-3, Acoustics – Laboratory measurement of sound insulation of building elements – Part 3: Measurement of impact sound insulation.
- EN 29052-1:1993, Acoustics – Determination of dynamic stiffness – Part 1: Materials used under floating floors in dwellings.
- EN 826:2013, Thermal insulating products for building applications – Determination of compression behaviour.

PHYSICAL PROPERTIES OF THE PRODUCT

Thickness: 3 mm

Weight: 1050 g/m²

Length: 10 m (+5-15 cm)

Coverage: 10 m²

ADDITIONAL TECHNICAL INFORMATION

Further information can be found at <https://scanunderlay.com/>.

PRODUCT RAW MATERIAL COMPOSITION

Product and Packaging Material	Weight, kg	Post-consumer %	Renewable %	Country Region of origin
Polypropylene textile	0,024	0	50	Denmark
Fiberbinder	0,082	0	100	Denmark
Recycled rubber	0,944	100	100	Denmark

SUBSTANCES, REACH - VERY HIGH CONCERN

The product does not contain any REACH SVHC substances in amounts greater than 0,1 % (1000 ppm).

PRODUCT LIFE-CYCLE

MANUFACTURING AND PACKAGING (A1-A3)

The environmental impacts considered in the product stage include the manufacturing of raw materials, packaging, and additional ancillary materials. Material losses occurring during the manufacturing processes are considered, which encompasses a 2.5% production loss due to side trim. These trim cut-offs are subsequently recycled and reintegrated into the production cycle.

The acoustic sound insulation material is crafted from used tires received as granulated powder and combined with a binding fiber. The main components of the product are granulated rubber powder, polyethylene terephthalate fibers, and spun-bound textile. The constituents are delivered to the manufacturing site in Denmark by lorry 16-32 metric ton, euro5 class trucks, ensuring an efficient mode of transportation.

Packaging materials include a wooden pallet, softwood boards and film, enabling secure transport of the acoustic material to the marketplace or construction site. The manufacturing process operates solely on wind-generated electricity, supported by a certificate of origin, and natural gas exclusively used for heating. Notably, our manufacturing process does not require water, thus eliminating the need for wastewater treatment.

TRANSPORT AND INSTALLATION (A4-A5)

Transportation impacts occurred from final products delivery to construction site (A4) cover fuel direct exhaust emissions, environmental impacts of fuel production, as well as related infrastructure emissions.

The transportation distance is defined according to the PCR. The average distance of transportation from the production plant to retailers site is assumed as 177 km and the transportation method is assumed to be lorry. Vehicle capacity utilization volume factor is assumed to be 1, which means full load. In reality, it may vary, but as the role of transportation emissions in total results is small, the variation in load is assumed to be negligible. Empty returns are not taken into account as it is assumed that return trip is used by the transportation company to serve the needs of other clients. (Empty returns are considered in the ecoinvent database.) Transportation does not cause losses as product is packaged properly. Environmental impacts from installation into the building include generation of waste packaging materials (A5) and release of biogenic carbon dioxide from wooden materials such as eur-flat pallets and stabilisation planks. The impacts of material production, its processing and its disposal as installation waste are also included. Electricity consumption for installation of the material is considered.

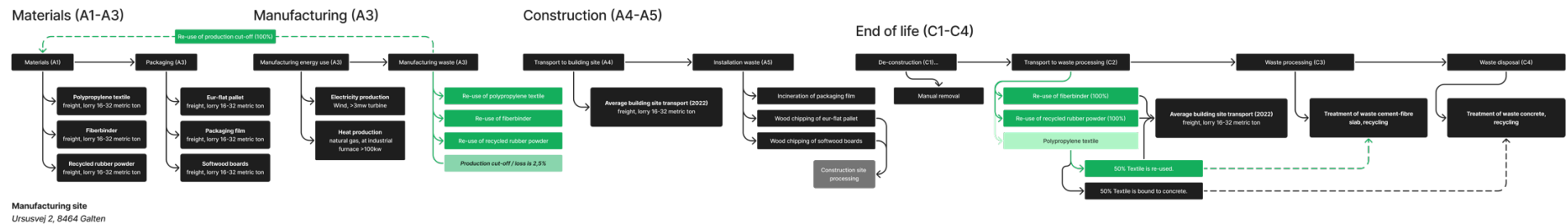
PRODUCT USE AND MAINTENANCE (B1-B7)

This EPD does not cover the use phase. Air, soil, and water impacts during the use phase have not been studied.

PRODUCT END OF LIFE (C1-C4, D)

Consumption of energy in de-construction process is considered. It is assumed that the waste is collected separately and transported to the waste treatment plant, with a recycling share of 99%. Transportation distance to treatment is assumed to be 177 km taken from the average distance between production plant and retailer site and the transportation method is assumed to be lorry (C2). Module C3 accounts for energy and resource inputs for sorting and treating these waste streams for recycling and incineration with energy recovery with efficiency greater than 60%. Additionally, waste that is incinerated without energy recovery or landfilled is included in Module C4. Due to the material and energy recovery potential of parts in the end of life product and packaging, recycled raw materials lead to avoided virgin material production, while the energy recovered from incineration replaces electricity and heat production (D). The benefits and loads of incineration and recycling are included in Module D.

MANUFACTURING PROCESS



LIFE-CYCLE ASSESSMENT

LIFE-CYCLE ASSESSMENT INFORMATION

Period for data 2022

DECLARED UNIT

Declared unit 1 m2

Mass per declared unit 1.05 kg

BIOGENIC CARBON CONTENT

Product's biogenic carbon content at the factory gate

Biogenic carbon content in product, kg C 0

Biogenic carbon content in packaging, kg C 0.07

SYSTEM BOUNDARY

This EPD covers the cradle-to-gate with modules C1–C4, module D and optional modules; A1 (Raw material supply), A2 (Transport) and A3 (Manufacturing), A4 (Transport to the building site), A5 (Installation into the building) as well as C1 (Deconstruction), C2 (Transport at end-of-life), C3 (Waste processing) and C4 (Disposal). In addition, module D - benefits and loads beyond the system boundary is included.

Product stage		Assembly stage			Use stage							End of life stage				Beyond the system boundaries		
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D	D	D
x	x	x	x	x	MND	MND	MND	MND	MND	MND	MND	x	x	x	x	x	x	x
Geography, by two-letter ISO country code or regions. The International EPD System only.																		
EU	EU	EU	EU	EU	-	-	-	-	-	-	-	EU	EU	EU	EU		EU	
Raw materials	Transport	Manufacturing	Transport	Assembly	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	Deconstr./demol.	Transport	Waste processing	Disposal	Reuse	Recovery	Recycling

Modules not declared = MND. Modules not relevant = MNR.

CUT-OFF CRITERIA

The study does not exclude any modules or processes which are stated mandatory in the EN 15804:2012+A2:2019 and the applied PCR. The study does not exclude any hazardous materials or substances.

The study includes all major raw material and energy consumption. All inputs and outputs of the unit processes, for which data is available for, are included in the calculation. There is no neglected unit process more than 1% of total mass or energy flows. The module specific total neglected input and output flows also do not exceed 5% of energy usage or mass.

The collected data covered all raw materials, consumables and packaging materials; associated transport to the manufacturing site; process energy and water use; direct production wastes; emissions to air and water. According to EN 15804 and the PCR, flows can be omitted (cut off) from a core process in the LCA up to a maximum of 1% of the total mass of material inputs or 1% of the total energy content of fuels and energy carriers; some ancillary materials used in small quantities within the process and amounting, in combination, to <0.1% of total input materials were omitted from the LCA underpinning this EPD.

ALLOCATION, ESTIMATES AND ASSUMPTIONS

Allocation is required if some material, energy, and waste data cannot be measured separately for the product under investigation.

In this study, as per EN 15804, allocation is conducted in the following order;

1. Allocation should be avoided.
2. Allocation should be based on physical properties (e.g. mass, volume) when the difference in revenue is small.
3. Allocation should be based on economic values.

In the background data, the ecoinvent default allocation is applied to all processes except those in which secondary materials are used, where the cut-off allocation is applied. This ensures that secondary materials are free of upstream burdens that arise prior to their reaching the end of waste state, in accordance with Section 6.3.4.2 of EN 15804. When the product reaches the end of its life, half of the textile remains bound to the concrete and is disposed of with the concrete, while the other half of the textile is recycled with the rest of the product. This allocation of textile waste is taken into account in the end-of-life calculations.

Allocation used in Ecoinvent 3.6 environmental data sources follows the methodology 'allocation, cut-off by classification'. This methodology is in line with the requirements of the EN 15804 -standard.

AVERAGES AND VARIABILITY

There is an average result considered for most aspects of this study, as the EPD refers to a group of similar products produced in the same production plant with same manufacturing process. However, there is an exception for the energy and gas consumption. The average result for energy and gas is calculated by considering the energy and gas consumption from the factory over the entire year across multiple products in same. It should be noted that the energy and gas consumption is consistent across all the products in this group.

The International EPD System additional data requirements

Data specificity and GWP-GHG variability for GWP-GHG for A1-A3.

Supply-chain specific data for GWP-GHG	>90 %
Variation in GWP-GHG between products	- %
Variation in GWP-GHG between sites	- %

ENVIRONMENTAL IMPACT DATA

Note: additional environmental impact data may be presented in annexes.

CORE ENVIRONMENTAL IMPACT INDICATORS – EN 15804+A2, PEF

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
GWP – total	kg CO ₂ e	3,47E-1	9,45E-3	-1,7E-1	1,87E-1	1,87E-2	2,56E-1	MND	MND	MND	MND	MND	MND	MND	0E0	3,07E-2	3,41E-3	4,8E-5	-3,98E-1
GWP – fossil	kg CO ₂ e	3,51E-1	1,14E-2	7,34E-2	4,35E-1	1,89E-2	1,25E-2	MND	MND	MND	MND	MND	MND	MND	0E0	3,07E-2	3,41E-3	4,8E-5	-3,98E-1
GWP – biogenic	kg CO ₂ e	-3,48E-3	5,04E-6	-2,44E-1	-2,47E-1	0E0	2,44E-1	MND	MND	MND	MND	MND	MND	MND	0E0	1,64E-5	9,49E-7	1,34E-8	-1,73E-1
GWP – LULUC	kg CO ₂ e	2,62E-4	4,05E-6	1,41E-4	4,07E-4	5,68E-6	2,32E-6	MND	MND	MND	MND	MND	MND	MND	0E0	1,09E-5	2,88E-7	4,06E-9	-2,2E-4
Ozone depletion pot.	kg CFC ₁₁ e	1,85E-8	2,6E-9	8,06E-9	2,92E-8	4,44E-9	9,58E-11	MND	MND	MND	MND	MND	MND	MND	0E0	6,98E-9	7,37E-10	1,04E-11	-2,07E-8
Acidification potential	mol H ⁺ e	1,54E-3	4,67E-5	2,92E-4	1,88E-3	7,93E-5	7,15E-6	MND	MND	MND	MND	MND	MND	MND	0E0	1,25E-4	3,57E-5	5,02E-7	-2,08E-3
EP-freshwater ³⁾	kg Pe	1,13E-5	9,56E-8	2,48E-6	1,39E-5	1,54E-7	1,08E-7	MND	MND	MND	MND	MND	MND	MND	0E0	2,57E-7	1,38E-8	1,94E-10	-1,39E-5
EP-marine	kg Ne	2,67E-4	1,39E-5	6,95E-5	3,51E-4	2,39E-5	1,47E-6	MND	MND	MND	MND	MND	MND	MND	0E0	3,73E-5	1,58E-5	2,22E-7	-3,24E-4
EP-terrestrial	mol Ne	2,94E-3	1,53E-4	7,82E-4	3,87E-3	2,64E-4	1,69E-5	MND	MND	MND	MND	MND	MND	MND	0E0	4,12E-4	1,73E-4	2,43E-6	-3,64E-3
POCP (“smog”)	kg NMVOCe	1,07E-3	4,69E-5	3,13E-4	1,42E-3	8,49E-5	4,26E-6	MND	MND	MND	MND	MND	MND	MND	0E0	1,26E-4	4,75E-5	6,69E-7	-1,21E-3
ADP-minerals & metals	kg Sbe	5,98E-6	3,09E-7	9,02E-7	7,2E-6	3,22E-7	5,72E-9	MND	MND	MND	MND	MND	MND	MND	0E0	8,31E-7	5,21E-9	7,33E-11	-5,16E-6
ADP-fossil resources	MJ	8,39E0	1,72E-1	1,35E0	9,91E0	2,94E-1	2,17E-2	MND	MND	MND	MND	MND	MND	MND	0E0	4,63E-1	4,7E-2	6,61E-4	-7,9E0
Water use ²⁾	m ³ e depr.	1,81E-1	5,55E-4	1,99E-2	2,01E-1	1,09E-3	2,8E-4	MND	MND	MND	MND	MND	MND	MND	0E0	1,49E-3	8,76E-5	1,23E-6	-1,42E-1

1) GWP = Global Warming Potential; EP = Eutrophication potential; POCP = Photochemical ozone formation; ADP = Abiotic depletion potential. 2) EN 15804+A2 disclaimer for Abiotic depletion and Water use and optional indicators except Particulate matter and Ionizing radiation, human health. The results of these environmental impact indicators shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator. 3) Required characterisation method and data are in kg P-eq. Multiply by 3,07 to get PO_{4e}.

USE OF NATURAL RESOURCES

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Renew. PER as energy	MJ	3,57E-1	2,43E-3	1,07E0	1,43E0	3,7E-3	3,5E-3	MND	MND	MND	MND	MND	MND	MND	0E0	6,54E-3	2,54E-4	3,57E-6	-6,98E-1
Renew. PER as material	MJ	0E0	0E0	2,31E0	2,31E0	0E0	-2,31E0	MND	MND	MND	MND	MND	MND	MND	0E0	0E0	0E0	0E0	0E0
Total use of renew. PER	MJ	3,57E-1	2,43E-3	3,38E0	3,74E0	3,7E-3	-2,3E0	MND	MND	MND	MND	MND	MND	MND	0E0	6,54E-3	2,54E-4	3,57E-6	-6,98E-1
Non-re. PER as energy	MJ	5,53E0	1,72E-1	1,17E0	6,87E0	2,94E-1	2,17E-2	MND	MND	MND	MND	MND	MND	MND	0E0	4,63E-1	4,7E-2	6,61E-4	-5,12E0
Non-re. PER as material	MJ	4E0	0E0	8,48E-2	4,08E0	0E0	-1,82E-1	MND	MND	MND	MND	MND	MND	MND	0E0	0E0	0E0	0E0	5,56E-1

Total use of non-re. PER	MJ	9,53E0	1,72E-1	1,25E0	1,1E1	2,94E-1	-1,61E-1	MND	MND	MND	MND	MND	MND	MND	0E0	4,63E-1	4,7E-2	6,61E-4	-4,56E0
Secondary materials	kg	9,69E-1	0E0	5,95E-5	9,69E-1	0E0	0E0	MND	MND	MND	MND	MND	MND	MND	0E0	0E0	0E0	0E0	-9,84E-4
Renew. secondary fuels	MJ	0E0	0E0	0E0	0E0	0E0	0E0	MND	MND	MND	MND	MND	MND	MND	0E0	0E0	0E0	0E0	0E0
Non-ren. secondary fuels	MJ	0E0	0E0	0E0	0E0	0E0	0E0	MND	MND	MND	MND	MND	MND	MND	0E0	0E0	0E0	0E0	0E0
Use of net fresh water	m ³	1,59E-3	2,94E-5	2,43E-4	1,86E-3	6,12E-5	9,2E-6	MND	MND	MND	MND	MND	MND	MND	0E0	7,91E-5	4,15E-6	5,84E-8	-1,5E-3

6) PER = Primary energy resources

END OF LIFE – WASTE

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Hazardous waste	kg	1,53E-2	1,75E-4	3,1E-3	1,86E-2	2,85E-4	1,53E-4	MND	MND	MND	MND	MND	MND	MND	0E0	4,7E-4	0E0	7,11E-7	-2,16E-2
Non-hazardous waste	kg	4,76E-1	1,2E-2	8,78E-2	5,76E-1	3,16E-2	8,53E-3	MND	MND	MND	MND	MND	MND	MND	0E0	3,23E-2	0E0	7,6E-6	-6,59E-1
Radioactive waste	kg	1,03E-5	1,18E-6	2,35E-6	1,39E-5	2,02E-6	1,35E-7	MND	MND	MND	MND	MND	MND	MND	0E0	3,17E-6	0E0	4,63E-9	-9,98E-6

END OF LIFE – OUTPUT FLOWS

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Components for re-use	kg	0E0	0E0	0E0	0E0	0E0	0E0	MND	MND	MND	MND	MND	MND	MND	0E0	0E0	0E0	0E0	0E0
Materials for recycling	kg	0E0	0E0	0E0	0E0	0E0	0E0	MND	MND	MND	MND	MND	MND	MND	0E0	0E0	0E0	0E0	0E0
Materials for energy rec	kg	0E0	0E0	0E0	0E0	0E0	0E0	MND	MND	MND	MND	MND	MND	MND	0E0	0E0	0E0	0E0	0E0
Exported energy	MJ	0E0	0E0	0E0	0E0	0E0	1,33E-1	MND	MND	MND	MND	MND	MND	MND	0E0	0E0	0E0	0E0	0E0

ENVIRONMENTAL IMPACTS – GWP-GHG - THE INTERNATIONAL EPD SYSTEM

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
GWP-GHG	kg CO ₂ e	3,51E-1	1,14E-2	7,34E-2	4,35E-1	1,89E-2	1,25E-2	MND	MND	MND	MND	MND	MND	MND	0E0	3,07E-2	3,41E-3	4,8E-5	-3,98E-1

8) This indicator includes all greenhouse gases excluding biogenic carbon dioxide uptake and emissions and biogenic carbon stored in the product as defined by IPCC AR 5 (IPCC 2013) This indicator is almost equal to the GWP indicator originally defined in EN 15804:2012+A1:2013.

SCENARIO DOCUMENTATION

Manufacturing energy scenario documentation

Scenario parameter	Value
Electricity data source and quality	Electricity production, wind
Electricity CO ₂ e / kWh	0,0023
District heating data source and quality	Heat production, natural gas
District heating CO ₂ e / kWh	0,0078

BIBLIOGRAPHY

ISO 14025:2010 Environmental labels and declarations – Type III environmental declarations. Principles and procedures.

ISO 14040:2006 Environmental management. Life cycle assessment. Principles and frameworks.

ISO 14044:2006 Environmental management. Life cycle assessment. Requirements and guidelines.

Ecoinvent database v3.6 (2019) and One Click LCA database.

EN 15804:2012+A2:2019 Sustainability in construction works – Environmental product declarations – Core rules for the product category of construction products.

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

Int'l EPD System PCR 2019:14 Construction products, version 1.11

EPD. General Programme Instructions of the international EPD® system. Version 4.0

Acoustic Silence 1050 LCA background report 01.05.2023

ABOUT THE MANUFACTURER

Scan Underlay, a Danish company, specializes in producing eco-friendly acoustic underlays from recycled tires. Established in 2015, the firm focuses on innovation, sustainability, and competitive pricing. By repurposing used tires, Scan Underlay actively reduces CO2 emissions, preventing landfill waste and tire incineration.

The versatile products are suitable for a range of applications, including under-screed insulation as well as laminate, vinyl, carpet, and wooden flooring. With a commitment to cutting-edge technology and environmental responsibility, Scan Underlay strives to make a positive impact on sustainable flooring solutions.

EPD AUTHOR AND CONTRIBUTORS

Manufacturer	Scan Underlay
EPD author	Christian Hansen, Scan Underlay
EPD verifier	Sergio A. Ballén Zamora
EPD program operator	The International EPD System
Background data	This EPD is based on Ecoinvent 3.6 (cut-off) and One Click LCA databases.
LCA software	The LCA and EPD have been created using One Click LCA Pre-Verified EPD Generator for Construction products

VERIFICATION STATEMENT

VERIFICATION PROCESS FOR THIS EPD

This EPD has been verified in accordance with ISO 14025 by an independent, third-party verifier by reviewing results, documents and compliancy with EN 15804, ISO 14025 and ISO 14040/14044, following the process and checklists of the program operator for:

- This Environmental Product Declaration
- The Life-Cycle Assessment used in this EPD
- The background report (project report) for this EPD

Why does verification transparency matter? [Read more online.](#)

VERIFICATION OVERVIEW

Following independent third party has verified this specific EPD:

EPD verification information	Answer
Independent EPD verifier	Sergio A. Ballén Zamora
EPD verification started on	2023-05-04
EPD verification completed on	2023-06-26
Supply-chain specific data %	>90
Approver of the EPD verifier	The International EPD System
Author & tool verification	Answer
EPD author	Christian Hansen, Scan Underlay
EPD author training completion	2023-05-03
EPD Generator module	Construction products
Independent software verifier	Ugo Pretato, Studio Fieschi
Software verification date	2021-05-11

THIRD-PARTY VERIFICATION STATEMENT

I hereby confirm that, following detailed examination, I have not established any relevant deviations by the studied Environmental Product Declaration (EPD), its LCA and project report, in terms of

- the data collected and used in the LCA calculations,
- the way the LCA-based calculations have been carried out,
- the presentation of environmental data in the EPD, and
- other additional environmental information, as present

with respect to the procedural and methodological requirements in ISO 14025:2010 and EN 15804:2012+A2:2019.

I confirm that the company-specific data has been examined as regards plausibility and consistency; the declaration owner is responsible for its factual integrity and legal compliance.

I confirm that I have sufficient knowledge and experience of construction products, this specific product category, the construction industry, relevant standards, and the geographical area of the EPD to carry out this verification.

I confirm my independence in my role as verifier; I have not been involved in the execution of the LCA or in the development of the declaration and have no conflicts of interest regarding this verification.



Sergio A. Ballén Zamora

VERIFICATION AND REGISTRATION (ENVIRONDEC)

ISO standard ISO 21930 and CEN standard EN 15804 serves as the core Product Category Rules (PCR)	
PCR	PCR 2019:14 Construction products, version 1.11 (05.02.2021)
PCR review was conducted by:	The Technical Committee of the International EPD® System. See www.environdec.com/TC for a list of members. Review chair: Claudia A. Peña, University of Concepción, Chile. The review panel may be contacted via the Secretariat www.environdec.com/contact .
Independent third-party verification of the declaration and data, according to ISO 14025:2006:	Independent verification of this EPD and data, according to ISO 14025: <input type="checkbox"/> Internal certification <input checked="" type="checkbox"/> External verification
Third party verifier	Sergio A. Ballén Zamora
	Approved by: The International EPD® System Technical Committee, supported by the Secretariat
Procedure for follow-up during EPD validity involves third party verifier	<input type="checkbox"/> yes <input checked="" type="checkbox"/> no



THE INTERNATIONAL EPD® SYSTEM

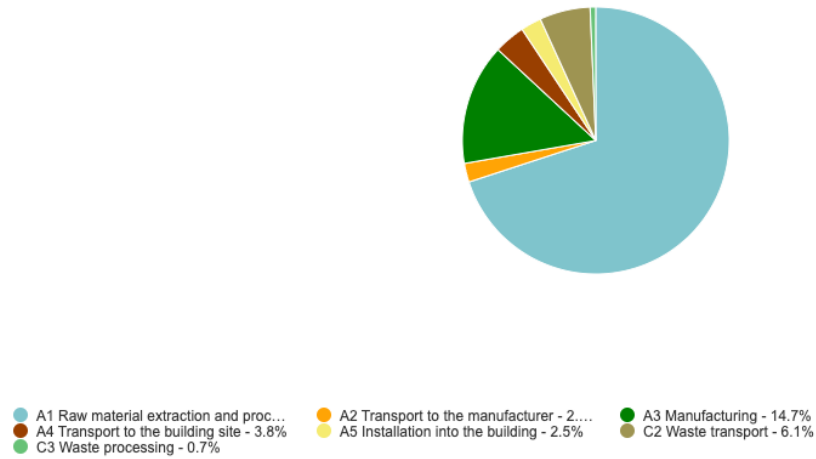
EPD International AB, Box 210 60, SE-100 31 Stockholm, Sweden, E-mail:
info@environdec.com

ANNEX 1 : ENVIRONMENTAL IMPACTS – EN 15804+A1, CML / ISO 21930

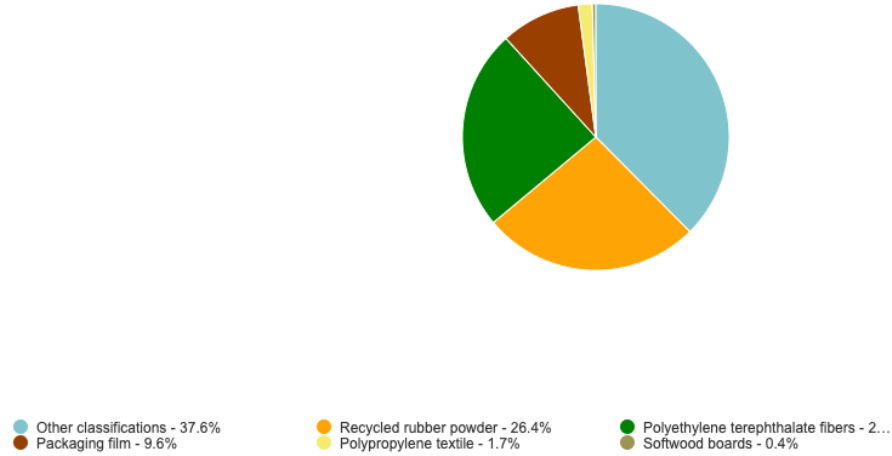
Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Global Warming Pot.	kg CO ₂ e	3,3E-1	1,13E-2	7,1E-2	4,13E-1	1,87E-2	1,25E-2	MND	MND	MND	MND	MND	MND	MND	0E0	3,04E-2	3,39E-3	4,77E-5	-3,78E-1
Ozone depletion Pot.	kg CFC ₋₁₁ e	1,74E-8	2,07E-9	6,46E-9	2,59E-8	3,53E-9	1,1E-10	MND	MND	MND	MND	MND	MND	MND	0E0	5,55E-9	5,83E-10	8,21E-12	-1,84E-8
Acidification	kg SO ₂ e	1,3E-3	2,29E-5	2,23E-4	1,54E-3	3,84E-5	5,88E-6	MND	MND	MND	MND	MND	MND	MND	0E0	6,16E-5	5,04E-6	7,09E-8	-1,78E-3
Eutrophication	kg PO ₄ ³ e	4,07E-4	4,71E-6	7,91E-5	4,91E-4	7,76E-6	4,26E-6	MND	MND	MND	MND	MND	MND	MND	0E0	1,27E-5	8,87E-7	1,25E-8	-4,84E-4
POCP ("smog")	kg C ₂ H ₄ e	7,43E-5	1,51E-6	2,28E-5	9,86E-5	2,43E-6	2,15E-7	MND	MND	MND	MND	MND	MND	MND	0E0	4,05E-6	5,19E-7	7,3E-9	-9,14E-5
ADP-elements	kg Sbe	5,98E-6	3,09E-7	9,02E-7	7,2E-6	3,22E-7	5,72E-9	MND	MND	MND	MND	MND	MND	MND	0E0	8,31E-7	5,21E-9	7,33E-11	-5,16E-6
ADP-fossil	MJ	8,39E0	1,72E-1	1,35E0	9,91E0	2,94E-1	2,17E-2	MND	MND	MND	MND	MND	MND	MND	0E0	4,63E-1	4,7E-2	6,61E-4	-7,9E0

ANNEX 6 : LIFE-CYCLE ASSESSMENT RESULT VISUALIZATION

Global Warming Potential fossil kg CO₂e - Life-cycle stages

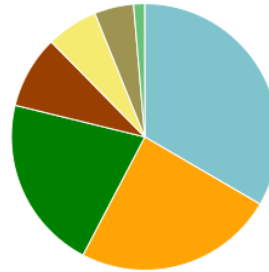


Global Warming Potential fossil kg CO₂e - Classifications



Global Warming Potential fossil kg CO2e - Resource types

This is a drilldown chart. Click on the chart to view details



- Transport of goods, Road - 33.4%
- 38:Waste collection, treatment and disposal - 38%
- 22:Manufacture of rubber and plastic products - 22%
- Other direct emissions - 6.3%
- 16:Manufacture of wood and of products of wood - 16%
- 20:Manufacture of chemicals and chemical products - 20%
- 13:Manufacture of textiles - 1.3%