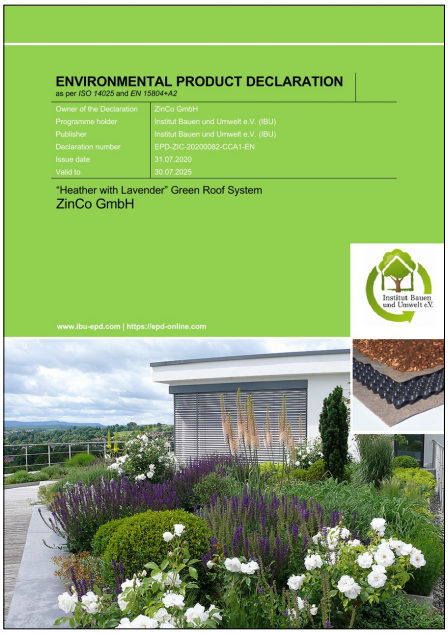
Info Sheet
Environmental Product Declaration for ZinCo Green Roof Systems

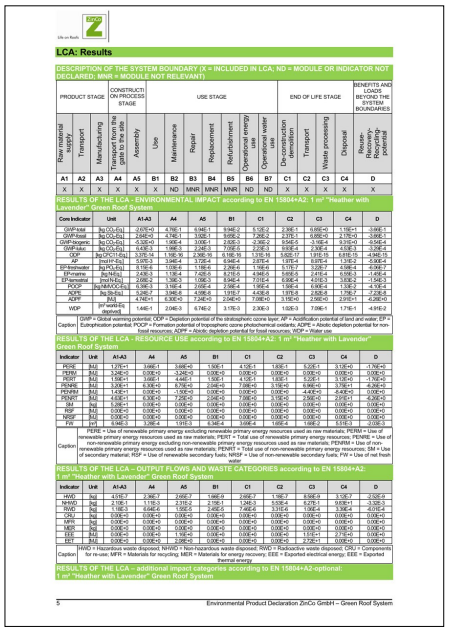


At the end of July 2020, the Institut Bauen und Umwelt e. V. (IBU) exemplarily published the EPD for the ZinCo green roof system „Heather with Lavender“*. The three letters EPD are the short form for Environmental Product Declaration. An EPD describes construction materials, construction products or construction components in terms of their environmental effect based on life cycle assessments as well as their functional and technical characteristics. This quantitative, objective and verified information relates to the entire life cycle of the construction product. EPDs therefore form an important basis for the sustainability assessment of buildings.
An EPD is a Type III-ecolabel. In an EPD, the scientifically determined values from the life cycle assessments of a product are summarized and documented according to a uniform scheme. Factual, neutral, scientifically well-founded and most importantly without evaluation.

An EPD is no certificate. This means that no demands are made on product quality, but on the quality and format of the data. EPDs are based on the standards ISO 14025 and EN 15804. Before the EPD is published by the IBU, it is checked and verified by independent third parties for its completeness, plausibility and conformity with the standards.

Detailed life cycle assessment data summarized well-arranged

The comprehensive and at the same time detailed life cycle assessment data and information contained in EPDs are summarized well-arranged in a standardized format on a few pages. They create the basis for the description and evaluation of structures to identify those with particularly low environmental effects. In a life cycle analysis, the life span of a building, the construction phase, the utilization phase with possible conversions as well as deconstruction and disposal are taken into account.
EPDs display a large number of indicators. For example, EPDs can be used to show the contribution of construction products to energy efficiency or further aspects of sustainable building management. Consequently, the internationally recognized EPDs form an important cornerstone in the building certification systems of e.g. DGNB, BREEAM and LEED.
In addition, an EPD contains information on the functional and technical characteristics of a product so that its capability within the building context can be assessed. This includes, for example, information on the height, weight, water storage and water drainage capacity of the system. But also on the specific properties of the components used in the system, such as protection mats, drainage elements, filter fleece and substrates.


LCA: Results

DESCRIPTION OF THE SYSTEM BOUNDARY (X = INCLUDED IN LCA; ND = MODULE OR INDICATOR NOT DECLARED; MNR = MODULE NOT RELEVANT)

PRODUCT STAGE			CONSTRUCTION PROCESS STAGE		USE STAGE								END OF LIFE STAGE				BENEFITS AND LOADS BEYOND THE SYSTEM BOUNDARIES
Raw material supply	Transport	Manufacturing	Transport from the gate to the site	Assembly	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction demolition	Transport	Waste processing	Disposal	Reuse-Recovery-Recycling-potential
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
X	X	X	X	X	ND	MNR	MNR	MNR	ND	ND	ND	X	X	X	X	X

RESULTS OF THE LCA – ENVIRONMENTAL IMPACT according to EN 15804+A2: 1 m² "Heather with Lavender" Green Roof System

Core Indicator	Unit	A1-A3	A4	A5	B1	C1	C2	C3	C4	D
GWP-total	[kg CO2-Eq.]	2.07E+0	4.79E-1	9.94E-1	9.94E-2	1.12E-2	2.39E-1	6.65E-2	1.15E-1	-3.93E-1
GWP-fossil	[kg CO2-Eq.]	2.07E+0	4.79E-1	9.94E-1	9.94E-2	1.12E-2	2.39E-1	6.65E-2	1.15E-1	-3.93E-1
GWP-biogenic	[kg CO2-Eq.]	-5.32E+0	1.66E-4	3.03E-1	2.62E-3	-2.36E-2	5.94E-5	4.16E-4	8.31E-5	-5.90E-4
GWP-luluc	[kg CO2-Eq.]	9.43E-3	1.99E-3	2.24E-3	7.05E-5	2.23E-3	9.93E-4	2.30E-4	4.53E-3	-3.39E-4
ODP	[kg CFC11-Eq.]	3.37E-7	1.19E-16	2.39E-16	6.18E-18	1.51E-18	5.92E-17	1.81E-18	6.61E-18	-4.94E-18
AP	[mol H+-Eq.]	5.97E-3	3.04E-4	3.72E-4	6.94E-4	2.87E-4	1.97E-4	8.97E-5	1.21E-2	-5.90E-4
EP-freshwater	[kg PO4-Eq.]	8.15E-5	1.03E-6	1.18E-6	2.26E-6	1.76E-6	5.17E-7	3.20E-7	4.59E-6	-6.39E-7
EP-marine	[kg N-Eq.]	2.43E-3	1.13E-4	7.42E-5	8.21E-5	4.94E-5	5.65E-5	2.41E-4	6.59E-3	-1.45E-4
EP-terrestrial	[mol N-Eq.]	2.68E-2	1.36E-3	1.09E-3	9.04E-4	7.01E-4	6.06E-4	4.91E-5	3.90E-2	-1.64E-3
POCP	[kg NMVOC-Eq.]	6.38E-3	3.16E-4	2.65E-4	2.39E-4	1.95E-4	1.58E-4	6.90E-5	1.13E-2	-4.10E-4
ADP-m*	[kg Sb-Eq.]	3.24E-7	3.39E-8	4.09E-8	1.91E-8	4.53E-9	2.86E-8	1.91E-8	2.56E-8	-4.28E-8
ADP-f	[MJ]	4.74E+1	6.30E+0	7.24E+0	2.04E+0	7.09E+0	3.15E+0	2.56E+0	2.76E+1	-6.28E+0
WDP	[m³ world-eq. deprived]	1.44E-1	2.04E-3	4.74E-2	3.17E-3	3.30E-3	1.02E-3	7.79E-1	1.71E-1	-4.91E-2

Caption: GWP = Global warming potential; ODP = Depletion potential of the stratospheric ozone layer; AP = Acidification potential of land and water; EP = Eutrophication potential; POCP = Formation potential of tropospheric ozone photochemical oxidants; ADPE = Abiotic depletion potential for non-fossil resources; ADPF = Abiotic depletion potential for fossil resources; WDP = Water use

RESULTS OF THE LCA – RESOURCE USE according to EN 15804+A2: 1 m² "Heather with Lavender" Green Roof System

Indicator	Unit	A1-A3	A4	A5	B1	C1	C2	C3	C4	D
PERE	[MJ]	1.77E+1	3.66E-1	3.66E+0	1.50E-1	4.12E-1	1.82E-1	5.22E-1	3.13E+0	-1.76E+0
PERM	[MJ]	3.24E+0	0.00E+0	-3.24E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
PERT	[MJ]	1.09E+1	3.66E-1	4.46E-1	1.50E-1	4.12E-1	1.82E-1	5.22E-1	3.13E+0	-1.76E+0
PENRE	[MJ]	3.30E+1	6.30E+0	8.70E+0	2.04E+0	7.09E+0	3.15E+0	6.96E+0	3.76E+1	-6.28E+0
PENRM	[MJ]	1.42E+1	0.00E+0	1.50E+0	0.00E+0	0.00E+0	0.00E+0	4.40E+0	6.42E+0	0.00E+0
PENRT	[MJ]	4.63E+1	6.30E+0	7.25E+0	2.04E+0	7.09E+0	3.15E+0	2.56E+0	2.91E+1	-6.28E+0
SM	[kg]	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
RSF	[MJ]	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
NRSF	[MJ]	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
FW	[m³]	6.96E-3	3.26E-4	1.01E-3	6.34E-4	3.66E-4	1.62E-4	6.51E-3	-3.03E-3	

Caption: PERE = Use of renewable primary energy excluding renewable primary energy resources used as raw materials; PERM = Use of renewable primary energy resources used as raw materials; PERT = Total use of renewable primary energy resources; PENRE = Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials; PENRM = Use of non-renewable primary energy resources used as raw materials; PENRT = Total use of non-renewable primary energy resources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Use of net fresh water

RESULTS OF THE LCA – OUTPUT FLOWS AND WASTE CATEGORIES according to EN 15804+A2: 1 m² "Heather with Lavender" Green Roof System

Indicator	Unit	A1-A3	A4	A5	B1	C1	C2	C3	C4	D
HWD	[kg]	4.01E-7	2.98E-7	2.65E-7	1.68E-9	2.65E-7	1.19E-7	8.58E-8	3.12E-7	-2.32E-8
NHWD	[kg]	2.19E-1	6.13E-2	1.72E-2	2.19E-2	1.46E-3	3.05E-2	6.82E-3	1.03E+0	-2.29E-2
HLRW	[kg]	5.19E-3	6.54E-4	1.55E-3	2.40E-5	1.49E-4	4.16E-5	1.09E-4	3.38E-4	-6.03E-5
ILLRW	[kg]	1.10E-3	1.69E-4	3.92E-4	6.20E-6	3.85E-5	1.07E-5	2.82E-5	8.73E-5	-1.56E-5
MFR	[kg]	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
MER	[kg]	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
EEE	[MJ]	0.00E+0	0.00E+0	1.16E+0	0.00E+0	0.00E+0	0.00E+0	1.01E+1	2.71E+1	0.00E+0
EET	[MJ]	0.00E+0	0.00E+0	2.28E+0	0.00E+0	0.00E+0	0.00E+0	4.72E+1	0.00E+0	0.00E+0

Caption: HWD = Hazardous waste disposed; NHWD = Non-hazardous waste disposed; RWD = Radioactive waste disposed; CRU = Components for re-use; MFR = Materials for recycling; MER = Materials for energy recovery; EEE = Exported electrical energy; EEE = Exported thermal energy

RESULTS OF THE LCA – additional impact categories according to EN 15804+A2-optional: 1 m² "Heather with Lavender" Green Roof System

5 Environmental Product Declaration ZinCo GmbH – Green Roof System

During the production of ZinCo roof greening materials (A1-A3) CO_2 is actually bound.

* The EPD for the ZinCo green roof system „Heather with Lavender“ is a so-called „core EPD“, which was created on the basis of the used components Protection Mat SSM 45, Floradrain®-element FD 40, Filter Sheet SF and 100 mm ZinCo System Substrate. However, the data of the other types of protection mats, drainage elements and filter fleeces are provided in the also checked and verified annex of the EPD, so that the corresponding LCA data and information can also be provided for most of the other ZinCo green roof systems, from extensive to intensive.

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Life on Roofs