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ECO PLATFORM EPD EN 15804 VERIFIED

Owner: Combitherm A/S
No.: MD-21044-EN
Issued: 13-09-2021
Valid to: 13-09-2026

3rd PARTY **VERIFIED**

EPD

VERIFIED ENVIRONMENTAL PRODUCT DECLARATION | **ISO 14025 & EN 15804**

Owner of declaration
Combitherm A/S
Industrivej 6, 8653 Them
CVR-nr.: 87130428

Program
EPD Danmark
www.epddanmark.dk

☐ Industry EPD
☒ Product EPD

Declared product(s)
Winter mat

Number of declared datasets/product variations: 1

Production site
Combitherm A/S
Industrivej 6
8653 Them
Denmark

Product(s) use
Winter Mats are used to insulate concreate during hardening.
Numbers are displayed in international notation eg.1,000.00

Declared/ functional unit
1m^2 of weather resistance insulation mat with a thermal resistance of R=0.99 m^{2}K/W

Year of data
1/6-2020 to 1/6-2021

EPD version
First version

Issued: 13-09-2021
Valid to: 13-09-2026

Basis of calculation
This EPD is developed in accordance with the European standard EN 15804+A2.

Comparability
EPDs of construction products may not be comparable if they do not comply with the requirements in EN 15804. EPD data may not be comparable if the datasets used are not developed in accordance with EN 15804 and if the background systems are not based on the same database.

Validity
This EPD has been verified in accordance with ISO 14025 and is valid for 5 years from the date of issue.

Use
The intended use of an EPD is to communicate scientifically based environmental information for construction products, for the purpose of assessing the environmental performance of buildings.

EPD type
☒Cradle-to-gate with modules C1-C4 and D
☐Cradle-to-gate with options, modules C1-C4 and D
☐Cradle-to-grave and module D
☐Cradle-to-gate
☐Cradle-to-gate with options

CEN standard EN 15804 serves as the core PCR

Independent verification of the declaration and data, according to EN ISO 14025

☐ internal ☒ external

Third party verifier:

Ninkie Bendtsen

Henrik Fred Larsen
EPD Danmark

Life cycle stages and modules (MND = module not declared)																
Product			Construction process		Use							End of life				Beyond the system boundary
Raw material supply	Transport	Manufacturing	Transport	Installation process	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction demolition	Transport	Waste processing	Disposal	Re-use, recovery, and recycling potential
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
X	X	X	MND	MND	MND	MND	MND	MND	MND	MND	MND	X	X	X	X	X

Product information

Product description

The main product components are shown in the table below.

Material	Weight-% of product	Kg/declared product
PET Wool (450 g/m^2)	71	0.443
Plastic foil	29	0.177
Total	**100**	**0.620**

The packaging materials are shown in the table below.

Paskeging	Weight-% of packaging	Kg/declared product
Disposable Pallets	51	0.025
Stretching Wrap	27	0.013
PEFOL Intermediate Foil	13	0.006
Shrink Caps	7	0.003
Nylon strap	3	0.001
Total	**100**	**0.048**

Winter mats are a nonwoven insulation product for insulation against cold when hardening cornet. It is made from 70-80% recycled Polyethylene fibers incased in thin Polyethylene film for protection against weather conditions.
The Polyethylene fibers are referred to as PET Wool. The PET Wool is produces as a nonwoven material with a density of 450 g/m2 and an average thickness of 50mm. The fibers are produced from a mix of 20-30% virgin material, and 70-80 % recycled bottle grade polyethylene.
The Winter mats described in this declaration are produced in the form of mats.
The finished product is referred to as Winter mats. Winter mat's function is to be laid on top of concrete while it hardens. The Winter mats provide thermal insulation for the hardening process thereby optimizing the result by providing a tougher and more durable concrete.

Representativity

This declaration, including data collection and the modeled life cycle, represents the production of 1m^2 of Winter mats on the production site located in Them, Denmark. Product specific data are based on average values collected in the period 1/6-2020 to 1/6-2021. Environmental data are based on the ecoinvent 3.7 datasets and are less than 10 years old. Generally, the used environmental datasets are of high quality, and most of the datasets are only a couple of years old.

Hazardous substances

Winter mats does not contain substances listed in the" Candidate List of Substances of Very High Concern for authorization"

(http://echa.europa.eu/candidate-list-table)

Essential characteristics

Winter mats are covered by harmonized technical specification DS/EN 15804:2012+A2:2019. Declaration of performance according to EU regulation 305/2011 is available for all declared product variations.

Further technical information can be obtained by contacting the manufacturer or on the manufacturer's website:

www.combitherm.dk

Reference Service Life (RSL)

The RSL is based on experience, showing that a 10-year life span is representative for this kind of product. The lifetime of the Winter mats bares no relation to the service life of the concrete it helps to harden.

Picture of product(s)

LCA background

Declared unit

The LCI and LCIA results in this EPD relates to 1m^2 of weather resistance insulation mat with a thermal resistance of R=0.99 m^{2}K/W.

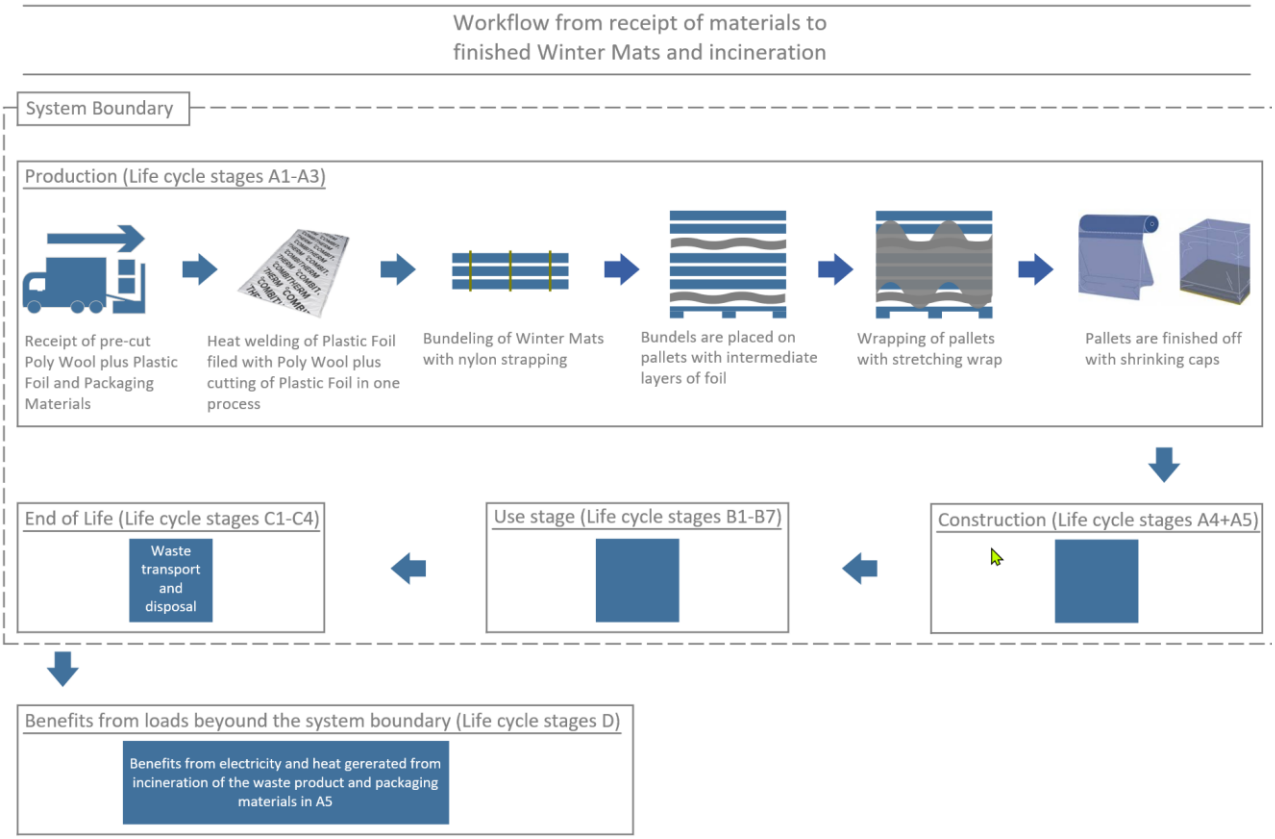
The reference product is a 50 mm thick Winter mat with a density of 620 g/m^2. For the calculation of the results in this declaration averages are formed based on the production volumes at the plant. This approach is considered conservative, as it contains all wastes related to the production and all energy use for supporting equipment and building heating.

Name	Value	Unit
Declared unit	1	m^2
Density	620	g/m^2
Conversion factor to 1 kg	1.612	m^2/kg

PCR

This EPD is developed according to the core rules for the product category of construction products in EN 15804, and the PCR for EPD Denmark, and /IBU 2017, PCR, Part B/ PCR-Part B: Requirements on the EPD for mineral insulating products, Institut Bauen und Umwelt e.V., www.bau-umwelt.com, November 2017.

Flowdiagram



The Flow diagram conforms with the requirements in the modular approach and shows phases even though not all are declared. The phases are described below.

System boundary

This EPD is based on a cradle-to-gate LCA, in which 100 weight-% are being accounted for.

The general rules for the exclusion of inputs and outputs follows the requirements in EN 15804, 6.3.5, where the total of neglected input flows per module shall be a maximum of 5 % of energy usage and mass and 1 % of energy usage and mass for unit processes.

Product stage (A1-A3) includes:

A1 – Extraction and processing of raw materials

A2 – Transport to the production site

A3 – Manufacturing processes

The product stage comprises the acquisition of all raw materials, products and energy, transport to the production site, packaging, and waste processing up to the" end-of-waste" state or final disposal. The LCA results are declared in aggregated form for the product stage, which means, that the sub-modules A1, A2 and A3 are declared as one module A1-3.

The PET Wool arrives precut to size and the entire process of covering it in foil, welding the foil together and cutting the foil to length is done in one process. Thereafter the Winter mats a bundled and strapped together, before being placed on disposable pallets with intermediate layers of foil. Once a palled is complete, it is wrapped in stretching wrap and finished of with shrinking caps before shipment. See flowchart.

Construction process stage (A4-A5) includes:
Stage A4 and A5 are not declared in this declaration.

Use stage (B1-B7) includes:

Stage B1-B7 are not declared in this declaration.

End of Life (C1-C4) includes:

The end-of-life stage includes:

C1 - de-construction, demolition
C2 - transport to waste processing
C3 - waste processing for reuse, recovery and/or recycling
C4 – disposal

The materials in Winter mats are fully recyclable. A study regarding handling of the product at the end-of-life stage, revealed that it is most likely to end up in local waste collection stations and being send to incineration. The benefits from recycling program are thereby not depicted in the assessment, and a conservative approach of assigning 1% to landfill is applied.

Reuse, recovery, and recycling potential (D) includes:
Any declared benefits and loads from net flows leaving the product system that have not been allocated as co-products and that have passed the end-of-waste state are included in module D. Such declared benefits can for Winter mats occur in stages C3 and C4. The generated energy, such as heat and electricity from waste incineration is assigned to module D. The benefits are calculated using current average substitution processes. Waste heat production is not credited for according to the conservative principle, as reliant data regarding coherence of heat demand and heat production was not found.

Electricity generated from waste is credited for with the specific electricity mix for Denmark. This is not applied for materials that are landfilled as the avoided impact of electricity production and/or thermal energy recovery from landfill gas recovery is not modeled. For the recycling of packaging material used for the Winter mats in module A1-3 it is important that no double counting occurs. The outputs of waste material from these modules are considered linked to the inputs of rPET into A1. Therefore, according to the allocation principle, the benefits are allocated to other users of the recycled material.

LCA results

ENVIRONMENTAL IMPACTS PER [1m² of weather resistance insulation mat with of R=0,99 m²K/W]							
Parameter	**Unit**	**A1-A3**	**C1**	**C2**	**C3**	**C4**	**D**
GWP-total	[kg CO_2 eq.]	1.11E+00	0.00E+00	5.44E-03	1.35E-02	2.05E-03	-8.79E-01
GWP-fossil	[kg CO_2 eq.]	1.22E+00	0.00E+00	5.44E-03	1.32E-02	1.51E-03	-8.63E-01
GWP-biogenic	[kg CO_2 eq.]	-1.10E-01	0.00E+00	-1.38E-06	3.13E-04	5.39E-04	-1.58E-02
GWP-luluc	[kg CO_2 eq.]	9.56E-04	0.00E+00	1.68E-06	1.88E-05	1.61E-06	-1.06E-03
ODP	[kg CFC 11 eq.]	7.79E-08	0.00E+00	1.23E-09	3.16E-10	1.92E-10	-2.58E-08
AP	[mol H^+ eq.]	5.70E-03	0.00E+00	2.24E-05	5.49E-05	7.66E-06	-3.71E-03
EP-freshwater	[kg PO_4 eq.]	3.60E-04	0.00E+00	4.21E-07	6.43E-06	3.43E-07	-3.80E-04
EP-marine	[kg N eq.]	1.27E-03	0.00E+00	6.42E-06	7.45E-06	3.10E-06	-5.30E-04
EP-terrestrial	[mol N eq.]	1.20E-02	0.00E+00	7.06E-05	1.36E-04	2.17E-05	-8.54E-03
POCP	[kg NMVOC eq.]	4.15E-03	0.00E+00	2.15E-05	1.79E-05	7.15E-06	-1.47E-03
ADPm[1]	[kg Sb eq.]	1.55E-06	0.00E+00	1.60E-08	8.63E-09	5.64E-09	-1.31E-06
ADPf[1]	[MJ]	2.75E+01	0.00E+00	8.17E-02	1.55E-01	2.52E-02	-1.20E+01
WDP[1]	[m^3]	4.49E-01	0.00E+00	4.60E-04	1.65E-03	3.70E-04	-1.64E-01
Caption	GWP-total = Globale Warming Potential - total; GWP-fossil = Global Warming Potential - fossil fuels; GWP-biogenic = Global Warming Potential - biogenic; GWP-luluc = Global Warming Potential - land use and land use change; ODP = Ozone Depletion; AP = Acidifcation; EP-freshwater = Eutrophication – aquatic freshwater; EP-marine = Eutrophication – aquatic marine; EP-terrestrial = Eutrophication – terrestrial; POCP = Photochemical zone formation; ADPm = Abiotic Depletion Potential – minerals and metals; ADPf = Abiotic Depletion Potential – fossil fuels; WDP = water use						
Disclaimer	[1] The results of this environmental indicator shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator.						

ADDITIONAL ENVIRONMENTAL IMPACTS PER [1m² of weather resistance insulation mat with of R=0,99 m²K/W]							
Parameter	**Unit**	**A1-A3**	**C1**	**C2**	**C3**	**C4**	**D**
PM	[Disease incidence]	4.98E-08	0.00E+00	3.77E-10	2.59E-10	1.12E-10	-2.16E-08
IRP[2]	[kBq U235 eq.]	1.49E-01	0.00E+00	3.98E-04	1.98E-03	9.23E-05	-1.12E-01
ETP-fw[1]	[CTUe]	7.58E+00	0.00E+00	5.25E-02	1.68E-01	1.88E-02	-1.03E+01
HTP-c[1]	[CTUh]	5.04E-10	0.00E+00	1.71E-12	2.52E-12	2.00E-12	-2.21E-10
HTP-nc[1]	[CTUh]	9.90E-09	0.00E+00	6.73E-11	7.82E-11	3.02E-11	-5.81E-09
SQP[1]	-	2.65E+01	0.00E+00	5.59E-02	2.29E-01	1.99E-02	-1.21E+01
Caption	PM = Particulate Matter emissions; IRP = Ionizing radiation – human health; ETP-fw = Eco toxicity – freshwater; HTP-c = Human toxicity – cancer effects; HTP-nc = Human toxicity – non cancer effects; SQP = Soil Quality (dimensionless)						
Disclaimers	[1] The results of this environmental indicator shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator.						
	[2] This impact category deals mainly with the eventual impact of low dose ionizing radiation on human health of the nuclear fuel cycle. It does not consider effects due to possible nuclear accidents, occupational exposure nor due to radioactive waste disposal in underground facilities. Potential ionizing radiation from the soil, from radon and from some construction materials is also not measured by this indicator.						

RESOURCE USE PER [1m² of weather resistance insulation mat with of R=0,99 m²K/W]							
Parameter	**Unit**	**A1-A3**	**C1**	**C2**	**C3**	**C4**	**D**
PERE	[MJ]	-1.19E+00	0.00E+00	-6.66E-04	-6.77E-02	-6.52E-04	3.49E+00
PERM	[MJ]	4.78E+00	0.00E+00	1.04E-03	1.13E-01	1.07E-03	-5.81E+00
PERT	[MJ]	3.58E+00	0.00E+00	3.71E-04	4.50E-02	4.19E-04	-2.31E+00
PENRE	[MJ]	-7.01E-04	0.00E+00	-3.03E-06	-5.95E-06	-2.43E-06	3.18E-04
PENRM	[MJ]	2.95E+01	0.00E+00	8.68E-02	1.63E-01	2.69E-02	-1.28E+01
PENRT	[MJ]	2.95E+01	0.00E+00	8.68E-02	1.63E-01	2.69E-02	-1.28E+01
SM	[kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
RSF	[MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NRSF	[MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW	[m³]	1.49E-02	0.00E+00	1.62E-05	4.73E-04	1.07E-05	-2.61E-02
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 = Net use of fresh water						

WASTE CATEGORIES AND OUTPUT FLOWS PER [1m² of weather resistance insulation mat with of R=0,99 m²K/W]							
Parameter	**Unit**	**A1-A3**	**C1**	**C2**	**C3**	**C4**	**D**
HWD	[kg]	1.65E-05	0.00E+00	5.01E-08	3.71E-07	2.08E-08	-5.86E-05
NHWD	[kg]	3.17E-01	0.00E+00	3.85E-03	7.45E-04	1.73E-03	-5.70E-02
RWD	[kg]	5.30E-05	0.00E+00	5.51E-07	5.09E-07	8.97E-08	-3.10E-05
CRU	[kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MFR	[kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MER	[kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
EE	[MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
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; EE = Exported energy						

BIOGENIC CARBON CONTENT PER [1m² of weather resistance insulation mat with of R=0,99 m²K/W]		
Parameter	**Unit**	**At the factory gate**
Biogenic carbon content in product	[kg C]	0,00
Biogenic carbon centent in accompanying packagaing	[kg C]	9.64E-03
Note	1 kg biogenic carbon is equivalent to 44/12 kg of CO_2	

Additional information

Technical information on scenarios

Transport to the building site (A4)

Scenario information	Value	Unit
Not relevant	INA	

Installation of the product in the building (A5)

Scenario information	Value	Unit
Not relevant	INA	

Reference service life

RSL information	Unit
Reference service Life	10 Years
Declared product properties	DoP
Design application parameters	DoP
Assumed quality of work	www. https://www.combitherm.dk/en-gb/products/thermal-winter-mats
Outdoor environment	www. https://www.combitherm.dk/en-gb/products/thermal-winter-mats
Indoor environment	www. https://www.combitherm.dk/en-gb/products/thermal-winter-mats
Usage conditions	www. https://www.combitherm.dk/en-gb/products/thermal-winter-mats
Maintenance	www. https://www.combitherm.dk/en-gb/products/thermal-winter-mats

Use (B1-B7)

Scenario information	Value	Unit
Not relevant		

End of life (C1-C4)

Scenario information	Value	Unit
Collected separately	0	[kg/declared product]
Collected with mixed waste	0	[kg/declared product]
For reuse	0	[kg/declared product]
For recycling (PET)	0.06	[kg/declared product]
For recycling (PP)	0.001	[kg/declared product]
For energy recovery (PET Wool,)	0.44	[kg/declared product]
For energy recovery (PET foil)	0.18	[kg/declared product]
For energy recovery (Eood pallets)	0.02	[kg/declared product]
For final disposal (landfill)	0.006	[kg/declared product]
Assumptions for scenario development	0	[kg/declared product]

Re-use, recovery, and recycling potential (D)

Scenario information/Materiel	Value	Unit
PET (Recycling)	0.06	[kg/declared product]
PP (Recycling)	0.001	[kg/declared product]
PET Wool (Incineration for electricity generation)	0.44	[kg/declared product]
PET foil (Incineration for electricity generation)	0.18	[kg/declared product]
Wood (Incineration for electricity generation)	0.02	[kg/declared product]

Indoor air

The EPD does not give information on release of dangerous substances to indoor air because the horizontal standards on measurement of release of regulated dangerous substances from construction products using harmonized test methods according to the provisions of the respective technical committees for European product standards are not available.

Soil and water

The EPD does not give information on release of dangerous substances to soil and water because the horizontal standards on measurement of release of regulated dangerous substances from construction products using harmonized test methods according to the provisions of the respective technical committees for European product standards are not available.

References

Publisher	epddanmark www.epddanmark.dk
Program operator	Danish Technological Institute Buildings & Environment Gregersensvej DK-2630 Taastrup www.teknologisk.dk
LCA-practitioner	Michael Hansen CO2Solutions Hindkjærvej 3 Mejrup 7500 Holstebro
LCA software /background data	SimaPro, version 9.2.0.2 Ecoinvent, version 3,7
3rd party verifier	Ninkie Bendtsen Niras A/S Sortemosevej 19 3450 Allerød Denmark

General program instructions
Version 2.0
www.epddanmark.dk

EN 15804
DS/EN 15804 + A2:2019 -" Sustainability of construction works – Environmental product declarations – Core rules for the product category of construction products"

EN 15942
DS/EN 15942:2011 –" Sustainability of construction works – Environmental product declarations – Communication format business-to-business"

ISO 14025
DS/EN ISO 14025:2010 –" Environmental labels and declarations – Type III environmental declarations – Principles and procedures"

ISO 14040
DS/EN ISO 14040:2008 –" Environmental management – Life cycle assessment – Principles and framework"

ISO 14044
DS/EN ISO 14044:2008 –" Environmental management – Life cycle assessment – Requirements and guidelines"