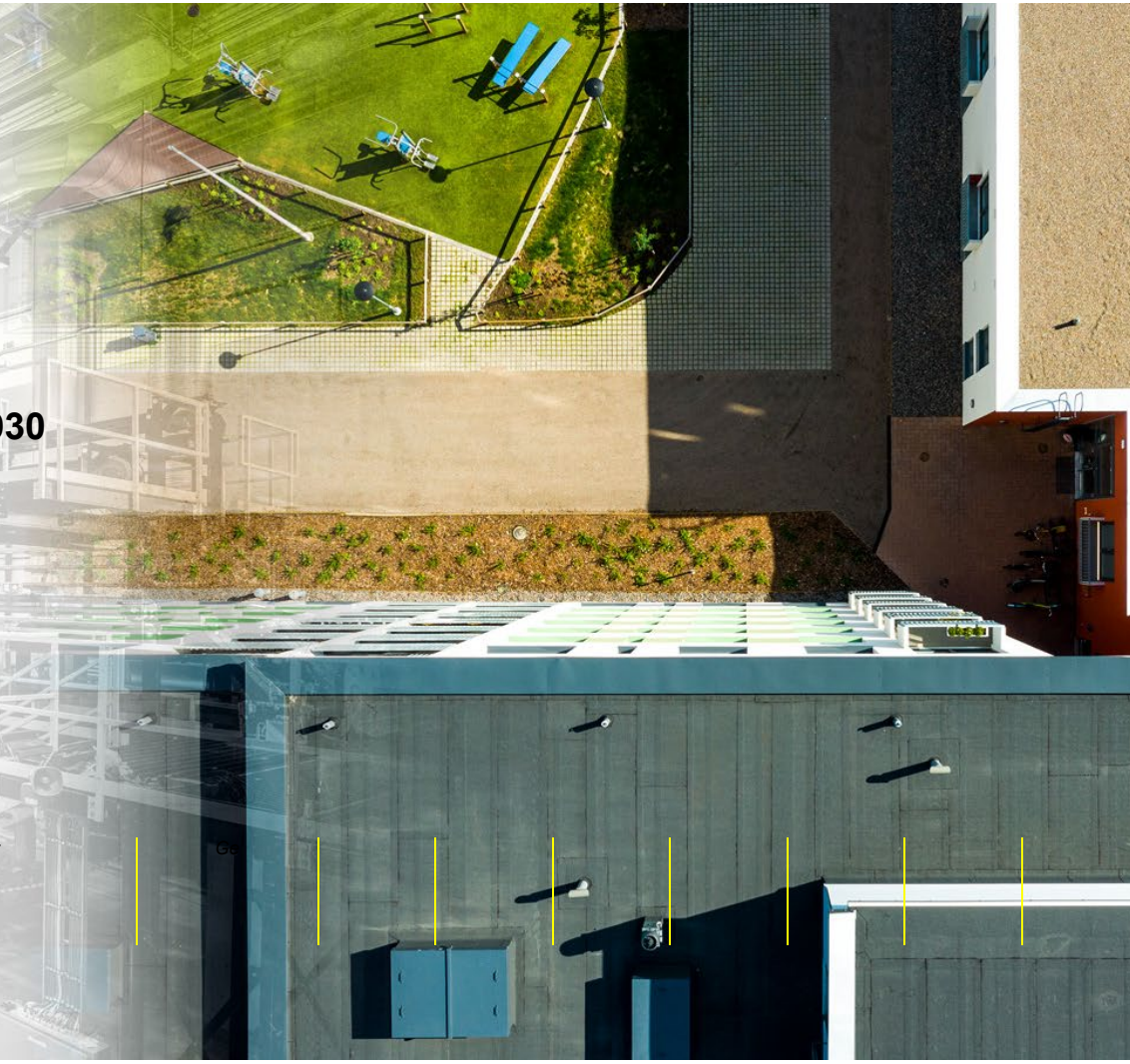
EPD®
THE INTERNATIONAL EPD® SYSTEM

KATEPAL

ENVIRONMENTAL PRODUCT DECLARATION

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



K-PS 170/5000 TORCH ON

KATEPAL OY

Programme: **The International EPD® System, www.environdec.com**	Programme operator: **EPD International AB**	EPD registration number: **S-P-02982**	Publication date: 2022-04-15	Valid until: 2027-04-15	Geographical scope: **Europe**

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	Katepal Oy
Address	Katepalintie 15, 37500 Lempäälä
Contact details	myynti@katepal.fi
Website	https://www.katepal.fi/

PRODUCT IDENTIFICATION

Product name	K-PS 170/5000 torch on
Additional label(s)	N/A
Product number / reference	N/A
Place(s) of production	Lempäälä, Finland
CPC code	5453 - Roofing and waterproofing services

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 and ISO 14025 standards.
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	Miia Kuhlman, Katepal Oy
EPD verification	Independent verification of this EPD and data, according to ISO 14025: ☐ Internal certification ☑ External verification
Verification date	2022-04-13
EPD verifier	Bárbara M Civit
EPD number	S-P-02982
ECO Platform nr.	-
Publishing date	2022-04-15
EPD valid until	2027-04-15

PRODUCT DESCRIPTION

K-PS 170/5000 is a bitumen membrane for roof waterproofing. The product is made of SBS- modified bitumen and reinforced with a polyester non-woven. Top surface of the product is covered with natural or coloured slate excluding the torch on edge. Bottom surface is covered with torch-on bitumen and thermofusible film.

PRODUCT APPLICATION

K-PS 170/5000 is a bitumen membrane for roof waterproofing. It is used as a top sheet for multi-layer applications for all kinds or roofs and buildings. Bitumen waterproofing membranes provide a good and durable protection against water penetration. Technical service life of a two-layer waterproofing system is 50 years.

TECHNICAL SPECIFICATIONS

K-PS 170/5000 is used in multi-layer applications as a top sheet. The product is installed by fully torching with 10 cm overlapping of the product.

PRODUCT STANDARDS

EN 13707 :2004 + A2 :2009
EN 13969 :2004 + A1 :2006

PHYSICAL PROPERTIES OF THE PRODUCT

Product information can be found from the Katepal Oy website https://katepal.fi/en/product/kps-en_gb/

ADDITIONAL TECHNICAL INFORMATION

Further information can be found at https://katepal.fi/en/

PRODUCT RAW MATERIAL COMPOSITION

Product and Packaging Material	Weight, kg	Post-consumer %	Renewable %	Country Region of origin
Bitumen	1,5-2,2	0	0	EU
Polymer (SBS)	0,1-0,3	0	0	EU
Reinforcement	0,1-0,3	0	0	EU
Minerals (sand,	2,6-3,8	0	0	EU
Wooden pallet	0,1	0	100	EU
PE film	0,01	0	0	EU
Cardboard	0,04	100	100	EU

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 bitumen is generally delivered as hot from the petroleum refinery to the manufacturing site, where it's heated further for the processing. The manufacturing is done by heating the raw materials (bitumen and copolymers) to a specific temperature and mixing them. The polyester nonwoven acting as a reinforcing structure is impregnated and coated with this bitumen mix. The resulting sheet is then faced with mineral granules and protective film. After cooling the product is cut to the right length, rolled and placed on a wooden pallet. The pallet is wrapped with PE shrink hood for storage and transportation.

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.

Freight mode and distances for transportation from production site to the construction site has been approached by most probable scenario based on the annual sales volume of the product. The most probable scenario for transportation distance is 200 km and for transportation method lorry. Vehicle capacity utilization volume factor is assumed to be 1 which means full load. In reality, it may vary but as role of transportation emissions in total results is small, the variety 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. Transportation does not cause losses as product are packaged properly. Also, volume capacity utilization factor is assumed to be 1 for the nested packaged products.

Installation of the product is done by torching, the use of propane torching gas is included in the calculation. Assumptions have been made for the amount of propane gas needed for the torching and for the waste generation during installation; the installation loss is assumed to be low, 0,5%.

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)

At the end-of-life, in the demolition phase 100% of the waste is assumed to be collected as separate construction waste. The consumption of energy and natural resources is negligible for disassembling of the end-of-life product, as demolition of bitumen membrane roofing is assumed to be done either manually or with a powered cutter. So the impacts of demolition are assumed zero (C1).

The bitumen roofing is delivered to the nearest construction waste treatment plant. It is estimated that there is no mass loss during the use of the product, therefore, the end-of-life product is assumed to have the same weight as the declared product. All of the end-of-life product is assumed to be sent to the closest facility for waste treatment. Transportation distance to the closest disposal area is estimated as 50 km and the transportation method is lorry which is the most common (C2).

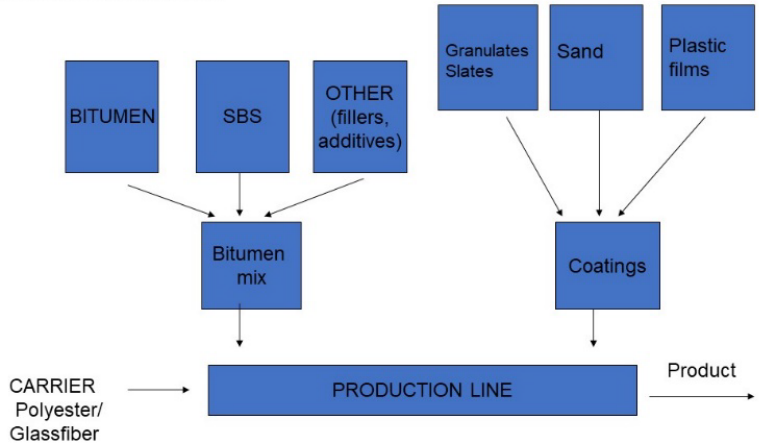
At the waste treatment plant, waste that can be reused, recycled or recovered for energy is separated and diverted for further use. The average European scenario according to a previous EPD made by EWA for bitumen roofing end-of-life is that 30 % goes to incineration and 10 % goes to recycling (C3). Unusable materials are disposed of in a landfill. According to EWA the rest 60 % of the product is assumed to be send to the landfill for final disposal (C4).

The end-of-life scenario for bitumen membrane in this study follows the end-of-life scenario for bitumen waterproofing membranes in the Finnish emission database for construction, which is maintained by Finnish Ministry of Environment. According to the scenario, 71% of de-constructed bitumen membrane goes to recycling-, and 6% to incineration with energy recovery (C3), and the rest 23% to landfill (C4).

Due to the recycling potential of bitumen roofing, it can be used as secondary raw material and as energy. Recycling of bitumen roofing avoids the use of virgin raw material, and the heat recovered from the combustion of bitumen roofing replaces the use of fossil fuels in energy production (D). The crushed bitumen roofing is used to replace bitumen in road construction and the energy generated by burning bitumen roofing replaces fossil fuel, which is assumed to be oil. The calculation assumes that the waste incineration plant has co-generation of electricity and heat.

MANUFACTURING PROCESS

PRODUCTION DIAGRAM



LIFE-CYCLE ASSESSMENT

LIFE-CYCLE ASSESSMENT INFORMATION

Period for data	2020

DECLARED AND FUNCTIONAL UNIT

Declared unit	1 m2 of installed K-PS 170/5000 roof
Mass per declared unit	5,36
Functional unit	N/A
Reference service life	N/A

BIOGENIC CARBON CONTENT

Product's biogenic carbon content at the factory gate

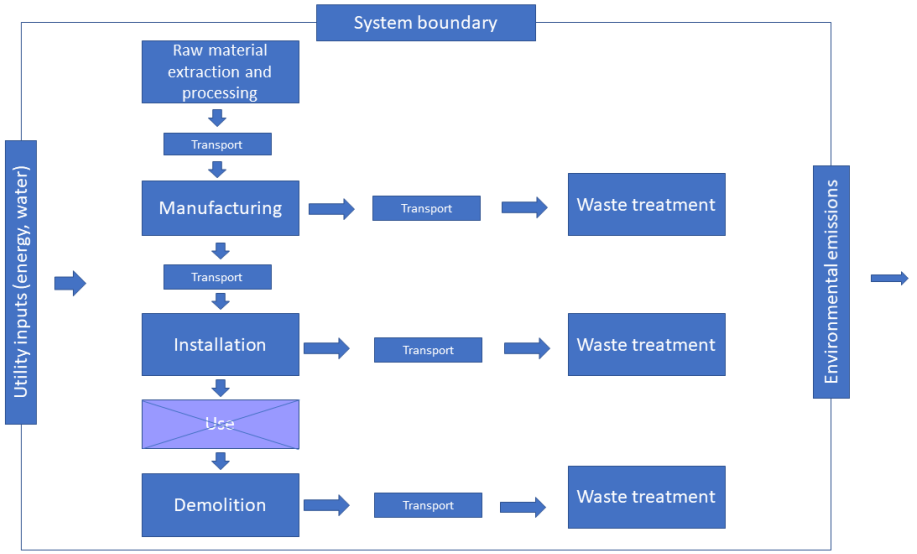
Biogenic carbon content in product, kg C	N/A
Biogenic carbon content in packaging, kg C	0.075

SYSTEM BOUNDARY

This EPD covers the *cradle to gate with options* scope with following modules; A1 (Raw material supply), A2 (Transport) and A3 (Manufacturing), A4 (Transport), A5 (Assembly) 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	MND	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.

For easier modelling and because of lack of accuracy in data and available modelling resources few constituents under 0,1% of product mass are excluded. These include some ancillary packaging materials that are have no serious impact on the emissions of the product.

Excluded modules are use stage modules (B1-B7), which are not mandatory according to the PCR. The life cycle analysis includes all industrial processes from raw material acquisition to production, distribution and end-of-life stages.
The production of capital equipment, construction activities, and infrastructure, maintenance and operation of capital equipment, personnel-related activities, energy and water use related to company management and sales activities are excluded.

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.

Module A1-A3: In this study allocation could not be avoided for ancillary material, energy consumption and waste production as the information was only measured on factory level. The inputs were allocated to studied product based on annual production volume mass. There was no need to conduct allocation for raw material and packaging data as the amounts per declared unit were gotten directly from the product recipe.

As a deviation from this, production loss was added to the values by including the allocated product related waste into the raw material inputs.

The values for 1 m2 of installed roof (declared unit) are calculated by considering the total annual production mass. In the factory, several kinds of bitumen roofing products are produced. For different manufactured products the area weight can vary from under 1kg to over 5 kg and thus the allocation by volume would produce different results. Allocation by mass is considered to be more accurate in this case.

Module A4: Transportation distance declared is the most probable scenario based on the sales volumes and locations of the customers. Transportation method is assumed to be lorry. The transportation doesn't cause losses as products are fixed properly. Also, volume capacity utilization factor is assumed to be 1 for the product.

Module A5: Product installation loss at the construction site is assumed to be very low (0,5%). The consumption of propane gas used for torching is an estimate from contractors, no specific data was available.

Module C1: Disassembling of bitumen roofing membrane is done either manually by hand or by using a cutter tool. The consumption of energy and natural resources is negligible for disassembling of the end-of-life product, and thus the impacts of demolition are assumed zero.

Module C2: It is estimated that there is no mass loss during the use of the product, therefore the end-of-life product is assumed that it has the same weight with the declared product. All of the end-of-life product is assumed to be sent to the closest facilities such as recycling and landfill. Transportation distance to the closest disposal area is estimated as 50 km and the transportation method is lorry which is the most common.

Module A2, A4 & C2: Vehicle capacity utilization volume factor is assumed to be 1 which means full load. In reality, it may vary but as role of transportation emission in total results is small, the variety 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.

Module C3, C4: The end-of-life scenario for bitumen membrane in this study follows the end-of-life scenario for bitumen waterproofing membranes in Finnish emission database for construction, which is maintained by Finnish Ministry of Environment. According to the scenario 71% of de-constructed bitumen membrane goes to recycling and 6% to incineration with energy recovery. All of the 0,5% loss during installation at the construction site is assumed to go to recycling, this is declared in the benefits and loads module separately. According to Finnish Ministry of environment the rest 23 % of bitumen membrane waste is assumed to be send to the landfill for final disposal. This is the scenario used in this study.

Module D: The energy generated by burning bitumen roofing replaces fossil fuels, oil. The calculation assumes that the waste incineration plant has co-generation of electricity and heat. The recycled bitumen roofing is recycled as replacement for virgin bitumen in asphalt. The recycled sheets can be used as direct replacement for virgin bitumen in asphalt.

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 no average result considered in this study since this EPD refers to one specific product produced in one production plant.

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	> 80%
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_2e	2,27E0	2,44E-1	-3,93E-2	2,47E0	1,84E-1	5,24E-1	MND	MND	MND	MND	MND	MND	MND	0E0	5,77E-2	1,52E0	1,84E-1	-3,86E-1
GWP – fossil	kg CO_2e	2,26E0	2,44E-1	2,15E-1	2,72E0	1,86E-1	2,33E-1	MND	MND	MND	MND	MND	MND	MND	0E0	5,77E-2	1,53E0	1,84E-1	-6,46E-1
GWP – biogenic	kg CO_2e	5,14E-3	1,42E-4	-2,57E-1	-2,51E-1	9,91E-5	2,91E-1	MND	MND	MND	MND	MND	MND	MND	0E0	2,85E-5	-6,37E-3	1,17E-4	2,6E-1
GWP – LULUC	kg CO_2e	6,66E-4	8,43E-5	1,88E-3	2,63E-3	6,58E-5	4,6E-5	MND	MND	MND	MND	MND	MND	MND	0E0	2,51E-5	8,85E-4	7,15E-6	2,94E-5
Ozone depletion pot.	kg CFC_{-11}e	1,49E-6	5,59E-8	2,42E-8	1,57E-6	4,22E-8	4,97E-8	MND	MND	MND	MND	MND	MND	MND	0E0	1,27E-8	1,11E-7	4,06E-9	-3,27E-7
Acidification potential	mol H^+e	1,56E-2	1,3E-3	6,22E-4	1,75E-2	7,58E-4	7,57E-4	MND	MND	MND	MND	MND	MND	MND	0E0	2,31E-4	4,37E-3	1,99E-4	-1,09E-2
EP-freshwater[2)]	kg Pe	4,07E-5	1,97E-6	7,46E-6	5,01E-5	1,55E-6	1,63E-6	MND	MND	MND	MND	MND	MND	MND	0E0	5,57E-7	2,53E-5	2,71E-7	-3,77E-5
EP-marine	kg Ne	2,17E-3	3,69E-4	1,5E-4	2,69E-3	2,25E-4	1,86E-4	MND	MND	MND	MND	MND	MND	MND	0E0	6,62E-5	1,21E-3	1,6E-4	-1,32E-3
EP-terrestrial	mol Ne	2,33E-2	4,08E-3	1,63E-3	2,9E-2	2,49E-3	2,01E-3	MND	MND	MND	MND	MND	MND	MND	0E0	7,32E-4	1,32E-2	4,24E-4	-1,45E-2
POCP ("smog")	kg NMVOCe	9,89E-3	1,23E-3	6,54E-4	1,18E-2	7,62E-4	7,03E-4	MND	MND	MND	MND	MND	MND	MND	0E0	2,25E-4	4,28E-3	1,67E-4	-5,33E-3
ADP-minerals & metals	kg Sbe	1,2E-5	5,26E-6	2,01E-6	1,93E-5	5,02E-6	7,04E-7	MND	MND	MND	MND	MND	MND	MND	0E0	2,07E-6	1,87E-5	1,42E-7	-1,46E-4
ADP-fossil resources	MJ	1,22E2	3,7E0	3,51E0	1,29E2	2,8E0	3,49E0	MND	MND	MND	MND	MND	MND	MND	0E0	8,58E-1	1,5E1	3,13E-1	-2,74E1
Water use[1)]	m^3e depr.	7,7E-1	1,26E-2	4,46E-2	8,27E-1	9,01E-3	1,36E-2	MND	MND	MND	MND	MND	MND	MND	0E0	3,05E-3	3,21E-1	1,37E-2	-2,97E-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.

ADDITIONAL (OPTIONAL) 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
Particulate matter	Incidence	1,03E-7	1,89E-8	1,48E-5	1,49E-5	1,29E-8	9,07E-9	MND	MND	MND	MND	MND	MND	MND	0E0	3,51E-9	7,55E-8	2,2E-9	-1,29E-7
Ionizing radiation[3)]	kBq U235e	4,1E-1	1,62E-2	5,03E-3	4,32E-1	1,22E-2	1,38E-2	MND	MND	MND	MND	MND	MND	MND	0E0	3,75E-3	4,51E-2	1,26E-3	-9,22E-2
Ecotoxicity (freshwater)	CTUe	6,11E1	2,82E0	3,24E0	6,71E1	2,16E0	2,19E0	MND	MND	MND	MND	MND	MND	MND	0E0	7E-1	1,58E1	4,13E-1	-4,47E1
Human toxicity, cancer	CTUh	6,75E-10	8,12E-11	1,81E-10	9,37E-10	6,28E-11	9,51E-11	MND	MND	MND	MND	MND	MND	MND	0E0	2,24E-11	1,61E-9	8,75E-12	-4,58E-10
Human tox. non-cancer	CTUh	2,05E-8	3,24E-9	2,05E-9	2,58E-8	2,44E-9	2,47E-9	MND	MND	MND	MND	MND	MND	MND	0E0	7,63E-10	2,24E-8	1,79E-10	-1,04E-8
SQP	-	1,74E0	4,15E0	4,39E-1	6,33E0	2,33E0	2,55E-1	MND	MND	MND	MND	MND	MND	MND	0E0	5,89E-1	9,1E0	1,09E0	-7,25E0

4) SQP = Land use related impacts/soil quality.5) EN 15804+A2 disclaimer for Ionizing radiation, human health. 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.

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	6,08E-1	4,86E-2	1,94E0	2,6E0	3,95E-2	4,97E-2	MND	MND	MND	MND	MND	MND	MND	0E0	1,46E-2	7,38E-1	6,6E-3	-1,42E0
Renew. PER as material	MJ	1,56E-1	0E0	2,63E0	2,79E0	0E0	4,78E-2	MND	MND	MND	MND	MND	MND	MND	0E0	0E0	0E0	0E0	-3,2E-1
Total use of renew. PER	MJ	7,64E-1	4,86E-2	4,57E0	5,39E0	3,95E-2	9,74E-2	MND	MND	MND	MND	MND	MND	MND	0E0	1,46E-2	7,38E-1	6,6E-3	-1,74E0
Non-re. PER as energy	MJ	1,09E2	3,7E0	3,18E0	1,16E2	2,8E0	3,42E0	MND	MND	MND	MND	MND	MND	MND	0E0	8,58E-1	1,5E1	3,13E-1	-2,71E1
Non-re. PER as material	MJ	1,36E1	0E0	3,3E-1	1,39E1	0E0	6,72E-2	MND	MND	MND	MND	MND	MND	MND	0E0	0E0	0E0	0E0	-3,22E-1
Total use of non-re. PER	MJ	1,22E2	3,7E0	3,51E0	1,29E2	2,8E0	3,49E0	MND	MND	MND	MND	MND	MND	MND	0E0	8,58E-1	1,5E1	3,13E-1	-2,74E1
Secondary materials	kg	9,83E-3	0E0	2,87E-4	1,01E-2	0E0	4,96E-5	MND	MND	MND	MND	MND	MND	MND	0E0	0E0	0E0	0E0	3,74E-2
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	1,64E-2	6,87E-4	8,4E-4	1,8E-2	4,78E-4	3,9E-4	MND	MND	MND	MND	MND	MND	MND	0E0	1,49E-4	4,49E-3	3,47E-4	-1,46E-2

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	1,14E-1	3,71E-3	7,7E-3	1,25E-1	2,84E-3	4,81E-3	MND	MND	MND	MND	MND	MND	MND	0E0	1,01E-3	0E0	5,62E-4	-4,1E-2
Non-hazardous waste	kg	1,17E0	3,17E-1	1,94E-1	1,68E0	1,95E-1	8,28E-2	MND	MND	MND	MND	MND	MND	MND	0E0	5,61E-2	0E0	1,23E0	-1,05E0
Radioactive waste	kg	6,66E-4	2,54E-5	5,64E-6	6,97E-4	1,92E-5	2,21E-5	MND	MND	MND	MND	MND	MND	MND	0E0	5,82E-6	0E0	1,89E-6	-1,43E-4

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	1,29E-1	1,29E-1	0E0	1,51E-1	MND	MND	MND	MND	MND	MND	MND	0E0	0E0	3,81E0	0E0	0E0
Materials for energy rec	kg	0E0	0E0	3,6E-3	3,6E-3	0E0	2,42E-1	MND	MND	MND	MND	MND	MND	MND	0E0	0E0	3,2E-1	0E0	0E0
Exported energy	MJ	0E0	0E0	0E0	0E0	0E0	0E0	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_2e	2,26E0	2,44E-1	2,15E-1	2,72E0	1,86E-1	2,33E-1	MND	MND	MND	MND	MND	MND	MND	0E0	5,77E-2	1,53E0	1,84E-1	-6,46E-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, 1-3mw turbine, onshore, Finland, ecoinvent 3.6, 2019
Electricity CO_2e / kWh	0.0165
District heating data source and quality	Heat production, natural gas, at boiler condensing modulating >100kw (Reference product: heat, district or industrial, natural gas), Finland, 2020, Ecoinvent 3.6
District heating CO_2e / kWh	0.23

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.

Int'l EPD System PCR 2019:14 Construction products, version 1.11 (05.02.2021)

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

K-PS 170/5000 torch on LCA background report 29.12.2021

ABOUT THE MANUFACTURER

Katepal Oy is a Finnish family-owned company with a history dating back in 1949. Main product categories are bitumen membranes, bitumen shingles and liquid applied bitumen products.
www.katepal.fi

EPD AUTHOR AND CONTRIBUTORS

Manufacturer	Katepal Oy
EPD author	Miia Kuhlman Katepal Oy
EPD verifier	Bárbara M Civit
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 Bitumen Membranes

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	Bárbara M Civit
EPD verification started on	2022-03-25
EPD verification completed on	2022-04-13
Supply-chain specific data %	> 80%
Approver of the EPD verifier	The International EPD System
Author & tool verification	**Answer**
EPD author	Miia Kuhlman Katepal Oy
EPD author training completion	2021-09-21
EPD Generator module	Bitumen Membranes
Independent software verifier	Ugo Pretato, Studio Fieschi & soci
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.

Bárbara M Civit

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
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: ☐ Internal certification ☑ External verification
Third party verifier	Bárbara M Civit
	Approved by: The International EPD® System Technical Committee, supported by the Secretariat
Procedure for follow-up during EPD validity involves third party verifier	☐ yes ☑ no

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_2e	2,12E0	2,42E-1	2,12E-1	2,58E0	1,84E-1	2,39E-1	MND	MND	MND	MND	MND	MND	MND	0E0	5,72E-2	1,49E0	1,3E-1	-6,11E-1
Ozone depletion Pot.	kg CFC_{-11}e	1,18E-6	4,45E-8	1,91E-8	1,25E-6	3,36E-8	3,94E-8	MND	MND	MND	MND	MND	MND	MND	0E0	1,01E-8	9,22E-8	3,25E-9	-2,57E-7
Acidification	kg SO_2e	1,33E-2	7,39E-4	4,83E-4	1,45E-2	3,72E-4	5,91E-4	MND	MND	MND	MND	MND	MND	MND	0E0	1,19E-4	2,75E-3	6,83E-3	-9,42E-3
Eutrophication	kg PO_4^3e	2,16E-3	1,25E-4	1,87E-4	2,48E-3	7,65E-5	1,72E-4	MND	MND	MND	MND	MND	MND	MND	0E0	2,61E-5	3,17E-3	7,17E-3	-1,46E-3
POCP (“smog”)	kg C_2H_4e	7,12E-4	3,75E-5	4,56E-5	7,95E-4	2,45E-5	6,22E-5	MND	MND	MND	MND	MND	MND	MND	0E0	7,78E-6	2,6E-4	3,01E-5	-4,05E-4
ADP-elements	kg Sbe	1,2E-5	5,26E-6	2,01E-6	1,93E-5	5,02E-6	7,04E-7	MND	MND	MND	MND	MND	MND	MND	0E0	2,07E-6	1,87E-5	1,42E-7	-1,46E-4
ADP-fossil	MJ	1,22E2	3,7E0	3,51E0	1,29E2	2,8E0	3,49E0	MND	MND	MND	MND	MND	MND	MND	0E0	8,58E-1	1,5E1	3,13E-1	-2,74E1