Environmental Product Declaration

In accordance with ISO 14025:2006 and EN 15804:2012+A2:2019/AC:2021 for:

Icopal Top 400 P

This is an EPD of multiple products based on a representative product.

The following products are included:

Top 400 P Sort 1x5 m (representative product)

Top 400 P Black 0.6X7.5 m

Top 400 P Light Grey 1.0x5 m

Top 400 P Light Grey 0.6x7.5 m

From

BMI Denmark

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General information

Programme information

Programme:	The International EPD® System
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Accountabilities for PCR, LCA and independent, third-party verification
Product Category Rules (PCR)
CEN standard EN 15804 serves as the Core Product Category Rules (PCR)
Product level PCR standard: prEN 17388-1:2023 Programme operator horizontal PCR: PCR 2019:14 Construction products (EN 15804+A2:2019 core PCR) (1.3.4)
PCR review was conducted by: The Technical Committee of the International EPD System. See www.environdec.com 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
Life Cycle Assessment (LCA)
LCA accountability: Lars Åhsberg, BMI Group, Sweden
LCA/EPD Tool: R<THINK by Nibe, The Netherlands
Third-party verification
Independent third-party verification of the declaration and data, according to ISO 14025:2006, via: X EPD verification by individual verifier Third-party verifier: Agnieszka Pikus, Greenwise Approved by: The International EPD® System
Procedure for follow-up of data during EPD validity involves third party verifier: ☐ Yes X No

The EPD owner has the sole ownership, liability, and responsibility for the EPD. EPDs within the same product category but registered in different EPD programmes, or not compliant with EN 15804, may not be comparable. For two EPDs to be comparable, they must be based on the same PCR (including the same version number) or be based on fully-aligned PCRs or versions of PCRs; cover products with identical functions, technical performances and use (e.g. identical declared/functional units); have equivalent system boundaries and descriptions of data; apply equivalent data quality requirements, methods of data collection, and allocation methods; apply identical cut-off rules and impact assessment methods (including the same version of characterisation factors); have equivalent content declarations; and be valid at the time of comparison. For further information about comparability, see EN 15804 and ISO 14025.

Company information

Owner of the EPD:

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Description of the organisation:

BMI Denmark is a leading provider of roofing and waterproofing solutions in Denmark, part of the broader BMI Group, which is Europe's largest manufacturer of flat and pitched roofing systems. The company offers a wide range of high-quality roofing products and services, including bitumen membranes, tiles, and roofing accessories.

Name and location of production site:

The declared products are produced at BMI Denmark´s production site in Ikast, Denmark.
Address: Nygade 13, 7430 Ikast, Denmark

Product information

Product name: **Icopal Top 400 P**

Product description and identification:

The declared product is used as an upper layer in a two-layer waterproofing system from BMI Icopal, made for roofs with particularly high demands on waterproofing. The system consists of an upper layer (Top) and a lower layer (Base), both based on SBS-modified bitumen. SBS increases the elasticity of the waterproofing layer and provides increased joint strength and service life. Two separate waterproofing layers provide a good protection against leakage. The product is used also for strips in the roof edges.

Icopal Top 400 P is used fully torched as an upper layer in roofing, typically with an underlay of one or more layers of Icopal Base. The installation module includes the additional production processes to compensate for the wastage of products that typically occurs during installation. Finally, this module includes the waste processing of the installation waste and product packaging. The product is expected to fulfill its function for 50 years.

Two-layer waterproofing systems are defined in the product standard EN 13707 Flexible sheets for waterproofing.

Multiple products and the representative product

This EPD applies to four varieties of Top 400 P, similar in content and field of use. Additionally, they are produced in the same BMI manufacturing site at Ikast. The results in this EPD are declared for the representative product **Top 400 P Sort 1x5 m**. The selection of the representative product is based on the fact that it had the largest production volume among the included products during the last years. The deviations of the declared GWP-GHG results for the included products for modules A1-A3 are less than 5% compared to the representative product, see table below.

Table. Included products, technical data and deviations in GWP-GHG compared to the representative product.

Product	Weight (kg/m^2)	Thickness (mm)	Deviation in GWP-GHG
Top 400 P Sort 1 x 5 m	5.9	4,2 -0,1/+0,2	representative product
Top 400 P Black 0.6X7.5 m	6.0	4,2 -0,1/+0,2	-4%
Top 400 P Light Grey 1.0x5.0m	5.9	4,2 -0,1/+0,2	-1%
Top 400 P Light Grey 0.6x7.5m	6.0	4,2 -0,1/+0,2	-5%

UN CPC code:

5453 Roofing and waterproofing services.

Geographical scope:

All inventories are modeled with respect to their specific origin when applicable. All life cycle stages are modelled per Denmark.

LCA information

Functional unit / declared unit:

1 m² installed upper layer of bitumen roof waterproofing, produced by BMI Ikast, Denmark.

The weight per 1 m^2 installed roof (including 10 % overlap) is 5.9 kg and the conversion factor to 1 kg is 0.168 m^2.

Reference service life:

50 years.

Time representativeness and data quality:

The specific data collected regarding manufacturing, packaging, suppliers and transports refer to the production year 2022. The data collection was performed by the EPD owner.

Background data is based on EPD´s and Ecoinvent 3.10. Foreground data is <2 years and background data <10 years. The data quality is considered to be good.

Database(s) and LCA software used:

LCA method R<THiNK:	EN15804+A2:2019
LCA software:	Simapro 9.1.1 (aligned with EF 3.1)
Characterization method:	EN 15804 +A2 Method v1.0
LCA database profiles:	EcoInvent version 3.10

Description of system boundaries:

The system boundary of the EPD follows the modularity approach defined by the EN 15804:2012+A2:2019. The type of EPD is cradle-to-grave and module D. List and explanation of the modules are declared in this EPD. No capital goods and/or infrastructure are included within the system boundaries.

Allocation used:

Environmental profile / dataset used	Explanation of used allocation method
Bitumen production final LCI - EUROBITUME 2021 System, with infrastructures [Eurobitume]	The allocation between bitumen and other co-products made from crude oil is based on mass balances at the crude oil extraction and the transport stages. At the refining level, the allocation is based on relative economic values. Source = Eurobitume.

Mass balance approaches (MBAs), to claim, for example, biobased, renewable, and/or recycled product content, are not applied.

Cut-off Criteria:

Product stage (A1-A3):
The production stage consists of the extraction of all raw materials, transportation of the raw materials, processing the raw materials into materials and the production of the product. The required energy for production, external treatments, ancillary materials, packaging material and production emissions are included. The total neglected input flows for A1-A3 do not exceed the limit of 5% of energy use and mass.

Construction process stage (A4-A5)
This stage consists of the transport of the product from the production plant to the construction site. It also includes installation waste. The additional needed production, transport and end-of-life of the installation waste is included. The end-of-life of packaging material up to the end-of-waste state or disposal of final residues is also included. The installation of the product including manufacture, transportation and end-of-life of ancillary materials and any energy or water use required for installation or operation of the construction site are taken into account. The total neglected input flows for A4-A5 do not exceed the limit of 5% of energy use and mass. The included scenarios, according to the LCA Report, are currently in use and represent the most likely alternatives.

Use stage (B1-B7)
There are no environmental impacts caused by the product during its use stage. There are no emissions (B1) and no consumption of raw materials. There is no need for maintenance (B2), repair (B3), replacements (B4) or refurbishments (B5) during the use of the product in standard conditions. The product does not consume energy (B6) or water (B7) during its operational life.

The included scenarios, according to the LCA Report, are currently in use and are representative for the most probable alternatives.

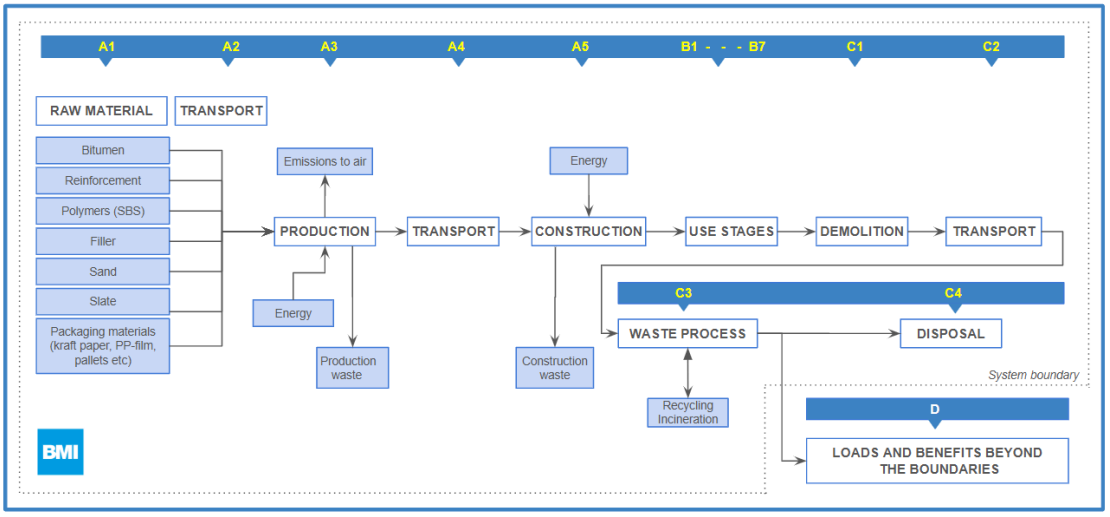
End of life stage (C1-C4)
When the end of the life stage of the building is reached, the de-construction/demolition begins. This EPD includes de-construction/demolition (C1), the necessary transport (C2) from the demolition site to the sorting location and distance to final disposal. The end of life stage includes the final disposal to landfill (C4), incineration (C3) and needed recycling processes up to the end-of-waste point (C3). Loads and benefits of recycling, re-use and exported energy are part of module D. The total neglected input flows for C1-C4 do not exceed the limit of 5% of energy use and mass. The included scenarios, according to the LCA Report, are currently in use and are representative for the most probable alternatives.

Benefits and loads beyond the system boundary (D)
This stage contains the potential loads and benefits of recycling and re-use of raw materials/products. The loads contain the needed recycling processes from end-of-waste-point up to the point-of-equivalence of the substituted primary raw material and a load for secondary material that will be lost at the end-of-life stage. The loads and benefits of recycling and reuse are included in this module.

Additional information:

For further information regarding the underlying LCA, contact LCA practitioner Lars Åhsberg: lars.ahsberg@bmigroup.com.

System diagram:



Modules declared, geographical scope, share of specific data (in GWP-GHG results) and data variation (in GWP-GHG results):

	Product stage			Construction stage		Use stage							End of life stage				Benefits and loads beyond the stage system boundaries
	Raw material supply	Transport	Manufacturing	Transport to site	Assembly	Use	Maintenance	Repair	Replacement	Refurnishment	Operational energy use	Operational water use	Deconstruction	Transport	Waste processing	Disposal	Reuse-, recovery-, recycling- potential
Modules	**A1**	**A2**	**A3**	**A4**	**A5**	**B1**	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**C1**	**C2**	**C3**	**C4**	**D**
Modules declared *	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Geography	DK	DK	DK	DK	DK	DK	DK	DK	DK	DK	DK	DK	DK	DK	DK	DK	DK
Specific data used **		<53%		-	-	-	-	-	-	-	-	-	-	-	-	-	-
Variation - products		<5%		-	-	-	-	-	-	-	-	-	-	-	-	-	-
Variation - sites		-		-	-	-	-	-	-	-	-	-	-	-	-	-	-

* X=Modules Assessed, ** The share of primary (specific) data is calculated based on GWP-GHG results. It is a simplified indicator for data quality that do not capture all relevant aspects of data quality. The indicator is not comparable across product categories.

Content information

Raw material and packaging materials

Product components	Weight-%	Variation Included products, weight -%	Post-consumer material, weight-%	Biogenic material, weight-%
Bitumen blend including filler	65-70	<2	0	0
Sand	5-7	<2	0	0
Reinforcement	2-4	<2	0	0
Slate	20-25	<2	0	0
Remaining materials	<1	<2	0	0
Packaging materials	**Weight, kg**	**Variation included products, weight -%**	**Weight-% (versus the product)**	**Weight biogenic carbon, kg C/kg**
Kraft paper	<0.01	0	<0.4	0.44
Plastic (LDPE)	<0.01	0	<0.4	0
Wood pallet	0.1	0	3	0.5

Origin of electricity

The used electricity (DK residual mix 2022) has the following sources; Fossil 74.3%, Renewable 16.3% and Nuclear 9.4%.
The emission factor is 557 g CO_2/kWh.

Dangerous substances from the candidate list of SVHC for Authorisation

For construction product EPDs complaint with EN15804, the content declaration shall list substances contained in the products that are listed in the “Candidate List of Substances of Very High Concern for Authorization” when their content exceeds the limits for registration with the European Chemicals Agency: i.e. >0.1 % of the weight of the product. No such substances are used in the production of the products covered in this EPD.

Results* of the environmental performance indicators

Mandatory impact category indicators according to EN 15804

Results per functional or declared unit																
Indicator	**Unit**	**A1-A3**	**A4**	**A5**	**B1**	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**C1**	**C2**	**C3**	**C4**	**D**
GWP-fossil	kg CO_2 eq.	2,99E+00	9,64E-02	7,23E-01	0	0	0	0	0	0	0	0	1,32E-01	5,41E+00	2,77E-01	-1,20E+00
GWP-biogenic	kg CO_2 eq.	-5,13E-01	0	5,13E-01	0	0	0	0	0	0	0	0	0	0	0	0
GWP-luluc	kg CO_2 eq.	2,32E-03	2,94E-05	7,73E-05	0	0	0	0	0	0	0	0	5,42E-05	1,96E-04	1,18E-05	-6,18E-03
GWP-total	**kg CO_2 eq.**	**2,48E+00**	**9,65E-02**	**1,24E+00**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1,32E-01**	**5,41E+00**	**2,77E-01**	**-1,21E+00**
ODP	kg CFC 11 eq.	3,04E+00	2,37E-08	1,86E-02	0	0	0	0	0	0	0	0	2,72E-01	2,04E-01	2,00E-01	-4,95E-01
AP	mol H^+ eq.	1,46E-02	3,10E-04	2,14E-03	0	0	0	0	0	0	0	0	5,36E-04	2,20E-03	3,19E-04	-3,06E-03
EP-freshwater	kg P eq.	4,13E-04	7,68E-07	6,03E-06	0	0	0	0	0	0	0	0	4,47E-05	1,08E-04	1,59E-05	-9,36E-05
EP-marine	kg N eq.	3,10E-03	6,80E-05	5,50E-04	0	0	0	0	0	0	0	0	1,20E-04	6,04E-04	2,27E-04	-6,98E-04
EP-terrestrial	mol N eq.	3,46E-02	7,58E-04	6,05E-03	0	0	0	0	0	0	0	0	1,33E-03	6,66E-03	6,13E-04	-8,36E-03
POCP	kg NMVOC eq.	1,13E-02	2,98E-04	2,06E-03	0	0	0	0	0	0	0	0	4,10E-04	1,89E-03	2,40E-04	-2,43E-03
ADP-mm**	kg Sb eq.	1,38E+01	1,72E-06	7,33E-02	0	0	0	0	0	0	0	0	3,83E-01	3,45E-01	9,85E-02	-6,73E+00
ADP-fossil**	MJ	1,52E+02	1,57E+00	9,41E+00	0	0	0	0	0	0	0	0	1,56E+00	3,09E+00	4,52E-01	-5,44E+01
WDP*	m^3	1,05E+00	5,09E-03	2,39E-02	0	0	0	0	0	0	0	0	4,80E-03	7,89E-02	1,92E-02	-1,61E-01
Acronyms	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 = Depletion potential of the stratospheric ozone layer; AP = Acidification potential, Accumulated Exceedance; EP-freshwater = Eutrophication potential, fraction of nutrients reaching freshwater end compartment; EP-marine = Eutrophication potential, fraction of nutrients reaching marine end compartment; EP-terrestrial = Eutrophication potential, Accumulated Exceedance; POCP = Formation potential of tropospheric ozone; ADP-mm = Abiotic depletion potential for non-fossil resources; ADP-fossil = Abiotic depletion for fossil resources potential; WDP = Water (user) deprivation potential, deprivation-weighted water consumption															

** The estimated impact results are only relative statements, which do not indicate the endpoints of the impact categories, exceeding threshold values, safety margins and/or risks. discouraging the use of the results of modules A1-A3 without considering the results of module C. ** The results of this environmental impact indicator shall be used with care as the uncertainties of these results are high or as there is limited experience with the indicator.*

Additional mandatory and voluntary impact category indicators

Results per functional or declared unit															
Indicator	**Unit**	**A1-A3**	**A4**	**A5**	**B1**	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**C1**	**C2**	**C3**	**C4**	**D**
GWP-GHG*	kg CO_2 eq.	2,48E+00	9,65E-02	1,24E+00	0	0	0	0	0	0	0	0	1,32E-01	5,41E+00	2,77E-01	-1,21E+00
Particulate matter emissions (PM)	Disease incidence	2,58E+00	8,46E-09	1,32E-02	0	0	0	0	0	0	0	0	2,03E-02	3,44E-02	4,72E-03	-4,08E-01
Ionizing radiation, human health (IRP)	kBq U235 eq.	8,81E-01	6,85E-03	4,01E-02	0	0	0	0	0	0	0	0	6,84E-03	9,84E-03	1,83E-03	-5,71E-01
Eco-toxicity - freshwater (ETP-fw)	CTUe	6,33E+01	1,25E+00	6,33E+00	0	0	0	0	0	0	0	0	1,40E+00	5,41E+00	6,14E-01	-1,68E+01
Human toxicity, cancer effect (HTP-c)	CTUh	3,76E-03	3,03E-11	2,71E-05	0	0	0	0	0	0	0	0	4,80E-04	1,06E-03	1,20E-04	-9,22E-04
Human toxicity, non-cancer effects (HTP-nc)	CTUh	2,88E-08	1,37E-09	7,04E-09	0	0	0	0	0	0	0	0	1,57E-09	7,60E-09	2,78E-10	-5,36E-09
Land use related impacts/Soil quality (SQP)	dimensionless	9,38E+01	1,79E+00	1,74E+00	0	0	0	0	0	0	0	0	9,30E-01	2,39E+00	1,06E+00	-3,01E+01

** This indicator accounts for all greenhouse gases except biogenic carbon dioxide uptake and emissions and biogenic carbon stored in the product. As such, the indicator is identical to GWP-total except that the CF for biogenic CO_2 is set to zero.*

Resource use indicators

Results per functional or declared unit															
Indicator	**Unit**	**A1-A3**	**A4**	**A5**	**B1**	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**C1**	**C2**	**C3**	**C4**	**D**
PERE	MJ	9,09E+00	1,97E-02	1,07E-01	0	0	0	0	0	0	0	0	3,31E-02	1,86E-01	1,05E-02	-9,52E+00
PERM	MJ	4,25E+00	0	2,12E-02	0	0	0	0	0	0	0	0	0	0	0	0
PERT	MJ	1,33E+01	1,97E-02	1,28E-01	0	0	0	0	0	0	0	0	3,31E-02	1,86E-01	1,05E-02	-9,52E+00
PENRE	MJ	8,82E+01	1,66E+00	9,64E+00	0	0	0	0	0	0	0	0	2,04E+00	3,63E+00	5,79E-01	-4,37E+01
PENRM	MJ	8,77E+01	0	4,40E-01	0	0	0	0	0	0	0	0	0	0	0	-2,07E+01
PENRT	MJ	1,76E+02	1,66E+00	1,01E+01	0	0	0	0	0	0	0	0	2,04E+00	3,63E+00	5,79E-01	-6,45E+01
SM	kg	1,82E-02	0	9,10E-05	0	0	0	0	0	0	0	0	0	0	0	0
RSF	MJ	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NRSF	MJ	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
FW	m^3	4,32E-02	1,78E-04	9,50E-04	0	0	0	0	0	0	0	0	2,41E-04	3,90E-03	4,04E-04	-1,51E-02
Acronyms	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 re-sources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Use of net fresh water															

Waste indicators

Results per functional or declared unit															
Indicator	**Unit**	**A1-A3**	**A4**	**A5**	**B1**	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**C1**	**C2**	**C3**	**C4**	**D**
Hazardous waste disposed	kg	2,07E-04	3,80E-06	1,85E-05	0	0	0	0	0	0	0	0	6,76E-06	9,38E-06	1,31E-06	-5,01E-05
Non-hazardous waste disposed	kg	5,29E-01	1,36E-01	5,91E-02	0	0	0	0	0	0	0	0	8,39E-02	9,31E-01	2,38E+00	-5,76E-02
Radioactive waste disposed	kg	1,42E-03	1,07E-05	6,44E-05	0	0	0	0	0	0	0	0	1,07E-05	1,21E-05	2,74E-06	-5,58E-04

Output flow indicators

Results per functional or declared unit																
Indicator	**Unit**	**A1-A3**	**A4**	**A5**	**B1**	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**C1**	**C2**	**C3**	**C4**	**D**
Components for re-use	kg	7,98E-03	0	3,99E-05	0	0	0	0	0	0	0	0	0	0,00E+00	0	0
Material for recycling	kg	4,91E-02	0	1,33E-01	0	0	0	0	0	0	0	0	0	8,91E-01	0	0
Materials for energy recovery	kg	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Exported energy, electricity	MJ	-1,67E-01	0	0	0	0	0	0	0	0	0	0	0	0	0	-7,43E+00
Exported energy, thermal	MJ	-2,88E-01	0	0	0	0	0	0	0	0	0	0	0	0	0	-1,28E+01

References

- General Programme Instructions of the International EPD® System. Version 5.0.
- PCR 2019:14 Construction products (EN 15804+A2:2019 core PCR) (1.3.4)
- EN 15804+A2 EN 15804+A2: 2019: Sustainability of construction works — Environmental Product Declarations — Core rules for the product category of construction products
- prEN 17388-1:2023 - Flexible sheets for waterproofing - Environmental product declaration - Product Category Rules for reinforced bitumen, plastic and rubber flexible sheets for (roof) waterproofing
- ISO 14040 ISO 14040:2006-10, Environmental management - Life cycle assessment - Principles and framework;
- EN ISO 14040:2006 ISO 14044 ISO 14044:2006-10, Environmental management - Life cycle assessment - Requirements and guidelines;
- EN ISO 14040:2006 ISO 14025 ISO 14025:2011-10: Environmental labels and declarations — Type III environmental declarations — Principles and procedures
- Åhsberg, L (2024). Life Cycle Assessment – LCA background reports Icopal Top 400 P, BMI Denmark

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