Environmental Product Declaration

In accordance with ISO 14025 and EN 15804 for:

Underlays for discontinuous roofing

from

BMI Group Sverige

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

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Product category rules (PCR): The International EPD System PCR for Construction Products and CPC 54 Construction Services 2012:01, version 2.31.
Independent third-party verification of the declaration and data, according to ISO 14025:2006: ☐ EPD process certification ☒ EPD verification
Procedure for follow-up of data during EPD validity involves third party verifier: ☐ Yes ☒ No

The EPD owner has the sole ownership, liability, and responsibility for the EPD. EPDs within the same product category but from different programs may not be comparable. EPDs of construction products may not be comparable if they do not comply with EN 15804.

Company information

Description of the organisation

BMI Sweden, with 165 years of experience, is the Swedish market leading producer of roofs and waterproofing systems, and other barrier systems that serve as an outer protection for buildings. With our expertise, we are dedicated to help with design, project solutions and technical advisory for both private homes and commercial buildings. We offer innovative roofing and waterproofing systems designed to transform the way people live and work. Our headquarters are located in Malmö, with production sites also in Borås, Örnsköldsvik and Grythyttan. We are certified according to ISO 9001 and ISO 14001. BMI Sweden is part of BMI Group, Europe's largest manufacturer of roofing and waterproofing solutions, with significant presence also in Asia and Africa. BMI Group offers some of the most acknowledged and entrusted brands in the industry, such as Monier, Icopal and Siplast.

For more information regarding the products or the organisation, see EPD owner's website: www.icopal.se.

Name and location of production site

The underlays for discontinuous roofing are produced at BMI Sweden's production site in Malmö, Sweden.
Address: BMI Group Sverige, Lodgatan 10, 211 24 Malmö, Sweden.

EPD Product information

Product name: This EPD covers seven products: Flexilight Bas, Flexilight Prima, Flexilight Pro, Ultra D, Flexitile, Flexi D and Flexisteel.

Product identification:
Lightweight bituminous underlays are technically defined by EN 13859-1:2014. The products included in this EPD can be divided into two product groups, UD1 and UD2, as declared in Table 1 below.

UN CPC code: 5453 Roofing and waterproofing services

***Table 1**. Product identification data for the five products included in this EPD.*

	Flexilight Bas	Flexilight Prima	Flexilight Pro	Ultra D	Flexitile	Flexi D	Flexisteel
UD-class	UD2	UD2	UD2	UD2	UD2	UD2	UD1
RISE P-mark	-	-	SC2042/12	-	-	-	-

Product description:
Bituminous underlays for discontinuous roofing functions as a waterproofing layer and are mounted underneath the roof's top covering, i.e. under tiles, shingles, tin sheets or waterproofing membranes. The underlays serve as a durable water protection and protect the underlaying structure during the roof's life. In addition, they also provide extra protection during the construction phase of the roof. The seven products included in this EPD are all designed to be used in Scandinavian weather conditions.

LCA information

Declared unit: 1 m^2 of Underlays for discontinuous roofing produced by BMI Icopal, ready for customer delivery.

Reference service life: Not applicable.

Time representativeness: The specific data collected regarding the core processes (module A3) refer to the production year 2018. The data collection was performed by the EPD owner.

Data sources and LCA software used:
LCA software: SimaPro 9.0.0
Database: Ecoinvent 3.5
Additional data sources: LCI Bitumen (Eurobitume, 2019), supplier specific data from EPDs and specific data collected from BMI Sweden and their suppliers (2018 and 2019).

Description of system boundaries:
Cradle-to-gate, i.e. life cycle stages A1-A3.

Excluded lifecycle stages: Since this is a cradle-to-gate EPD, life cycle stages A4, B1-B7, C1-C4 and D are neither considered nor declared.

Geographical scope: All inventories (module A1-A3) are modelled with respect to their specific origin. The scope of this EPD does not cover the use phase or end-of-life-phase, thus no geographical scope is accounted for in this EPD.

Allocation methodology: The cut-off method has been applied within the product system. For allocations between product systems, the Polluter-pays allocation method has been used.

Cut-off: All raw materials according to the product formula, including their respective energy demands and waste generation during extraction and production have been considered, as well as the main packaging materials used to prepare the final product for distribution to customer. Some packaging materials & production solvents that constitute less than 1% of the product weight have been excluded. This cut-off rule does not apply for hazardous material and substances.

Additional information:

All seven products have been modelled individually, however the results are presented for groups of products when the difference in the mandatory impact indicators is lower than ±10%. Therefore, the results for Flexilight Bas, Prima, Pro and Ultra D are presented as a flat average, and the results for Flexitile and Flexi D as a flat average.

For further information regarding the underlying LCA, contact LCA practitioner Annika Löwgren: annika.lowgren@dge.se

System diagram

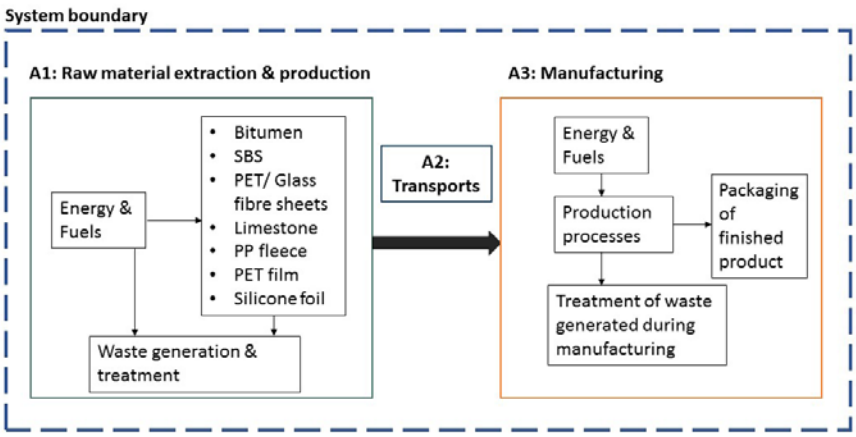

Figure 2. *Flow diagram of the assessed life cycle phases of the underlays for discontinuous roofing, beginning with raw material extraction and production, followed by transport from suppliers to Malmö and manufacturing at BMI Sweden's production site. The nomenclature A1-A3 refers to the standard stated by EN 15804. A further description of the life cycle phases included in the assessment is provided in Table 3.*

Table 2.*Table declaring the life cycle stages included in the LCA. X= included in the LCA, MND= Module Not Declared.*

Product stage			Construction process stage		Use stage							End of life stage				Resource recovery stage
Raw materials	**Transport**	**Manufacturing**	Transport	Construction-Installation	Use stage	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction	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**	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND

Description of life cycle stages A1-A3: Raw material extraction and supply, Transport and Manufacture

Table 3. *A detailed description of the life cycle stages included in this LCA.*

Stage	Description
A1 **Raw materials**	The extraction, processing and refining of all raw materials (see table 4) occurring upstream from the manufacturing of the underlays are included in this section. This also includes the energy and fuel generation needed for these processes (extraction, refining and transport of energy from primary energy sources). Recycling processes of secondary materials from a previous product system that are used in these manufacturing processes are also included, however processes that are part of the waste processing in the previous product system are excluded, referring to the Polluter-pays principle.
A2 **Transport**	The external transportation of raw materials to the manufacturing site. The modelling includes transportation on road and water, covering the transport of each raw material to the manufacturing site in Malmö.
A3 **Manufacturing**	The manufacturing of the underlays takes place at BMI Sweden's production site in Malmö, Sweden. Bitumen is mixed with SBS and stored in big holding tanks before being pumped to the production line. The PET or glass fibre sheet is running through the production and is applied with two layers of bitumen blends, one on each side. Then, PP-fleece is applied on the back and front of the product, while the silicone foil is applied on the edges. For both heating and cooling needed during production, coolants and hot oil are used in closed systems and is thus not consumed during the manufacturing process. The finished product is rolled, packed on pallets and supported with additional packaging before sent to customers. The manufacturing process includes the energy- and fuel consumption and emissions on site, production of all packaging materials and treatment of waste generated in the manufacturing process.

Content declaration per declared unit

Underlays for discontinuous roofing

Raw material	Weight % interval per m^2
Reinforcement (PET/Glass fibre sheet)	6-14%
SBS	4–7%
Bitumen	47-75%
Limestone	0-35%
PET film	1–2%
PP fleece	5–11%
Silicone foil	<1%

***Table 4**. Content declaration of the seven products covered in this EPD; Flexilight Bas, Prima and Pro, Ultra D, Flexitile, Flexi D and Flexitsteel. The ranges cover the variation in composition between these products.*

For construction product EPDs compliant with EN 15804, 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.**

Recycled material

Provenience of recycled materials (pre-consumer or post-consumer) in the product: One of the PET-sheets used as reinforcement is made of 100% recycled polyester from post-consumer recycled PET-bottles. A product specific EPD has been used as data for this inventory.

Environmental performance

1 m² Underlays for discontinuous roofing

Environmental impact

IMPACT CATEGORY	UNIT	UD1	UD2	
		Flexisteel	Flexilight & Ultra D	Flexitile & Flexi D
Acidification potential (AP)	kg SO_2 eq.	6,22E-03	4,65E-03	4,63E-03
Eutrophication potential (EP)	kg PO_4^{3-} eq.	2,64E-03	2,00E-03	1,87E-03
Global warming potential (GWP100a)	kg CO_2 eq.	1,76E+00	1,23E+00	1,24E+00
Formation potential of tropospheric ozone (POCP)	kg C_2H_4 eq.	1,18E-03	6,94E-04	7,16E-04
Abiotic depletion potential – Elements	kg Sb eq.	1,13E-06	1,42E-06	1,82E-06
Abiotic depletion potential – Fossil resources	MJ, net calorific value	6,99E+01	4,43E+01	4,63E+01
Depletion potential of the stratospheric ozone layer (ODP)	kg CFC 11 eq.	1,09E-07	8,53E-08	7,96E-08

Table 5. *The results from the LCA showing the environmental impacts during module A1-A3 (cradle-to-gate) for the two product categories of underlays; UD1 and UD2. Category UD1 covers the product Flexisteel and UD2 the products Flexilight, Ultra D, Flexitile and Flexi D. The results reported for the UD2 category products is the flat average of the products included in each product group, since the difference between these products is less than ±10% in the mandatory impact indicators. This is in accordance with The International EPD System PCR for Construction Products and CPC 54 Construction Services 2012:01, version 2.31.*

1 m² Underlays for discontinuous roofing

Use of resources

PARAMETER		UNIT	UD1	UD2	
			Flexisteel	Flexilight & Ultra D	Flexitile & Flexi D
Primary energy resources – Renewable	Use as energy carrier	MJ, net calorific value	2,6	2,4	2,5
	Used as raw materials	MJ, net calorific value	3,3	1,9	1,9
	TOTAL	**MJ, net calorific value**	**5,9**	**4,3**	**4,4**
Primary energy resources – Non-renewable	Use as energy carrier	MJ, net calorific value	30,4	20,0	20,7
	Used as raw materials	MJ, net calorific value	43,3	27,3	28,5
	TOTAL	**MJ, net calorific value**	**73,7**	**47,3**	**49,2**
Secondary material		**kg**	0,113	-	-
Renewable secondary fuels		MJ, net calorific value	-	-	-
Non-renewable secondary fuels		MJ, net calorific value	-	-	-
Net use of fresh water		**m³**	5,98E-03	1,96E-02	4,54E-03

***Table 6**. The results from the LCA showing the resource consumption during module A1-A3 (cradle-to-gate) for the two product categories of underlays; UD1 and UD2. Category UD1 covers the product Flexisteel and UD2 the products Flexilight, Ultra D, Flexitile and Flexi D. The results reported for the UD2 category products is the flat average of the products included in each product group, since the difference between these products is less than ±10% in the mandatory impact indicators. This is in accordance with The International EPD System PCR for Construction Products and CPC 54 Construction Services 2012:01, version 2.31.*

Waste production and output flows

1 m^2 Underlays for discontinuous roofing

Waste production

IMPACT CATEGORY	UNIT	UD1	UD2	
		Flexisteel	Flexilight & Ultra D	Flexitile & Flexi D
Hazardous waste disposed	kg	5,38E-03	4,63E-03	4,43E-03
Non-hazardous waste disposed	kg	2,01E-02	7,46E-03	8,22E-04
Radioactive waste disposed	kg	9,12E-05	9,12E-05	9,12E-05

Table 7. *The results from the LCA showing the waste generation during module A1-A3 (cradle-to-gate) for the two product categories of underlays.*

Output flows

IMPACT CATEGORY	UNIT	UD1	UD2	
		Flexisteel	Flexilight & Ultra D	Flexitile & Flexi D
Components for reuse	kg	0	0	0
Materials for recycling	kg	3,61E-01	3,61E-01	3,63E-01
Materials for energy recovery	kg	4,00E-02	4,00E-02	4,00E-02
Energy recovery	MJ	0	0	0

Table 8. *The results from the LCA showing the output flows during module A1-A3 (cradle-to-gate) for the two product categories of underlays.*

References

General Programme Instructions of the International EPD® System. Version 3.0.

The International EPD System PCR 2012:01. Construction Products and Construction Services. Version 2.31

EN 15804:2012+A1:2013 Sustainability of construction works - Environmental product declarations - Core rules for the product category of construction products

ISO 14025. *Environmental Labels and Declarations – Type III Environmental Declarations – Principles and Procedures (SS-EN ISO 14025:2006).* Stockholm, Sweden: Swedish Standards Institute (SIS förlag AB).

ISO 14040. (2006). *Environmental Management – Life cycle assessment – Principles and framework (SS-EN ISO 14040:2006).* Stockholm, Sweden.: Swedish Standards Institute (SIS förlag AB)

ISO 14044. *Environmental Management – Life cycle assessment – Requirements and guidelines (SS-EN ISO 14044:2006).* Stockholm, Sweden: Swedish Standards Institute (SIS förlag AB).

Löwgren, A. & Åhsberg, L. (2020). *Life Cycle Assessment – Underlays for discontinuous roofing.* Life Cycle Assessment made for BMI Group Sverige by DGE Mark & Miljö

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