Environmental Product Declaration

In accordance with ISO 14025 and EN 15804 for:

Reinforced bitumen sheets for exposed roof waterproofing

from

BMI Group Sverige

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

	EPD Owner BMI Group Sverige Hyllie Boulevard 35 215 37 Malmö Hans Månsson, Technical Director 073-625 74 39 e-mail: hans.mansson@bmigroup.com www.bmigroup.com
	EPD Programme The International EPD® System EPD International AB Box 210 60 SE-100 31 Stockholm Sweden www.environdec.com info@environdec.com
	EPD Producer DGE Mark och Miljö Box 258 391 23 Kalmar
	Third party Verifier Pär Lindman Miljögiraff AB Övre Hövik 25 411 16 Göteborg

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 reinforced bitumen sheets 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 the products Icopal Mono P, Icopal Mono PC, Icopal Mono PM, Icopal Mono PR and Icopal Mono Noxite.

Product identification:

Reinforced bitumen sheets for roof waterproofing are defined in the product standard EN 13707 *Flexible sheets for waterproofing.* **UN CPC code:** 5453 Roofing and waterproofing services

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

	Mono P	Mono PC	Mono PM	Mono PR	Mono Noxite
Product identification code	010-1020	010-1030	010-1010	010-1000	
Waterproofing class	TKY-A-0234	TKY-A-1234	TKY-A-0234	TKY-B-0034	TKY-A-0234
Quality mark	SEP5800	SEP5800	SEP5800	SEP5500	SEP5800
RISE P-mark	-	-	SC0151/02	SC0600/01	
SINTEF		TG 2425	TG 2425		

Product description:

Icopal Mono is a weldable, single-layer, high-quality roof waterproofing system based on SBS-modified bitumen. It fits all types of roof structures and is applicable for new roofing as well as re-roofing of existing roofs. It is attached through welding and fastened mechanically. Icopal Mono is adapted to Nordic conditions, well tested and has an expected service lifetime of 40 years. The Icopal Mono reinforced bitumen sheets are available in several versions and in many colours to suit the surface and the appearance of the building. The system meets fire requirements according to BROOF (t2).

***Figure 1**. Example picture of installed Icopal Mono reinforced bitumen sheets.*

LCA information

Declared unit: 1 m^2 of Icopal Mono reinforced bitumen sheet for roof waterproofing ready for customer delivery.

Reference service life: Not applicable.

Time representativeness: The specific data collected regarding manufacturing, packaging, suppliers and transports 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. All background data used from generic datasets is less than 10 years old.

Additional data sources: LCI Bitumen from Eurobitume (2019) and specific data collected from BMI Sweden and their suppliers (2018).

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 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:

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

System diagram

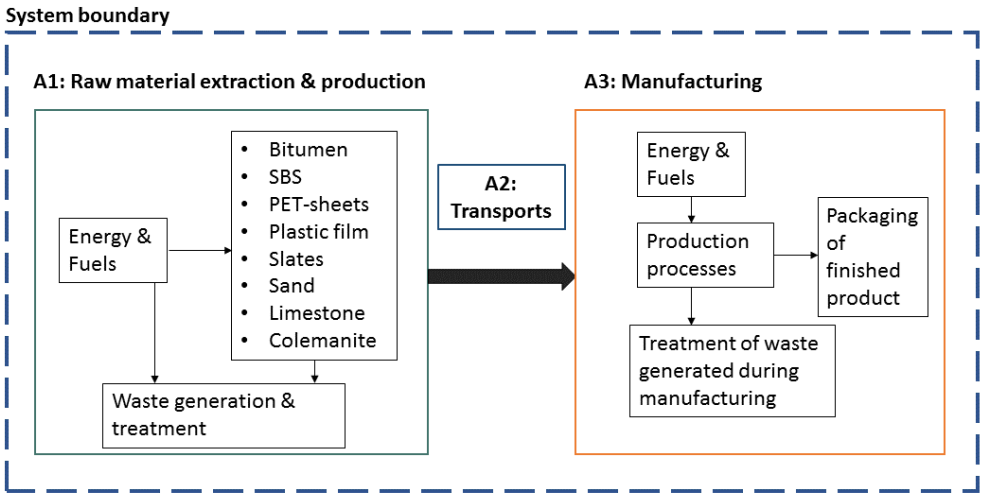

Figure 2. *Flow diagram of the assessed life cycle phases for Icopal Mono reinforced bitumen sheets, beginning with raw material extraction and production, followed by transport from suppliers to Malmö and manufacturing at BMI Sweden's production site. The nomenclature A1-A3 refers to the standard stated 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) used in the production of the Icopal Mono reinforced bitumen sheets occurring upstream from the manufacturing site are included in this section. This also includes the energy 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, rail and water, covering the transport of each raw material to the manufacturing site in Malmö.
A3 **Manufacturing**	The manufacturing takes place at BMI Sweden's production site in Malmö, Sweden. Bitumen is mixed with SBS and limestone/colemanite and stored in big holding tanks before being pumped to the production line. The PET-sheet is running through the production line and is applied with different layers of bitumen blends. Sand is applied on the backside of the product, slates are applied on the topside and lastly polypropylene foil is applied on the backside of the product. 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, all packaging materials and treatment of waste generated in the manufacturing process.

Content declaration per declared unit

Icopal Mono reinforced bitumen sheets for exposed roof waterproofing

Raw material	Weight % interval per m^2
PET sheet with glass threads	0-5%
PET sheet with glass fleece	0-5%
SBS	4-5%
Bitumen	36-41%
Colemanite	0-11%
Limestone	18-31%
Slates	13-18%
Sand	5-7%
PP foil	<1%

***Table 4**. Content declaration of the five products covered in this EPD; Mono P, Mono PM, Mono PR, Mono PC and Mono Noxite. Calculations are based on weight % of each raw material per declared unit 1 m^2 for each product. The average product weight is 5,51 kg/m^2.*

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: The Bitumen blend used in all five products covered by this EPD has a recycled content of 4% recycled bitumen. The PET-sheets used in Mono PM and Mono PR consist of 50% recycled materials.

Environmental performance

1 m² Icopal Mono reinforced bitumen sheet for exposed roof waterproofing

Environmental impact

IMPACT CATEGORY	UNIT	Mono P	Mono PC	Mono PM	Mono PR	Mono Noxite
Acidification potential (AP)	kg SO_2 eq.	1,47E-02	1,56E-02	1,36E-02	1,17E-02	2,01E-02
Eutrophication potential (EP)	kg PO_4^{3-} eq.	4,99E-03	5,26E-03	4,62E-03	4,01E-03	5,76E-03
Global warming potential (GWP100a)	kg CO_2 eq.	3,57E+00	3,72E+00	2,98E+00	2,57E+00	4,07E+00
Formation potential of tropospheric ozone (POCP)	kg C_2H_4 eq.	3,36E-03	3,41E-03	3,34E-03	3,14E-03	3,72E-03
Abiotic depletion potential – Elements	kg Sb eq.	9,58E-06	9,79E-06	5,53E-06	4,47E-06	1,10E-05
Abiotic depletion potential – Fossil resources	MJ, net calorific value	1,49E+02	1,63E+02	1,46E+02	1,35E+02	1,59E+02
Depletion potential of the stratospheric ozone layer (ODP)	kg CFC 11 eq.	2,45E-07	2,60E-07	3,02E-07	2,49E-07	1,88E-06

Table 5. *The results from the LCA showing the environmental impacts during module A1-A3 (cradle-to-gate) for each product of the Icopal Mono reinforced bitumen sheets.*

1 m² Icopal Mono reinforced bitumen sheet for exposed roof waterproofing

Use of resources

PARAMETER		UNIT	Mono P	Mono PC	Mono PM	Mono PR	Mono Noxite
Primary energy resources – Renewable	Use as energy carrier	MJ, net calorific value	7,4	7,4	7,1	6,8	7,7
	Used as raw materials	MJ, net calorific value	2,3	2,3	2,3	2,3	2,3
	TOTAL	**MJ, net calorific value**	**9,7**	**9,7**	**9,4**	**9,1**	**10,0**
Primary energy resources – Non-renewable	Use as energy carrier	MJ, net calorific value	59	62	49	43	66
	Used as raw materials	MJ, net calorific value	97	109	104	98	101
	TOTAL	**MJ, net calorific value**	**156**	**171**	**153**	**141**	**167**
Secondary material		**kg**	0,07	0,09	0,2	0,2	0,08
Renewable secondary fuels		MJ, net calorific value	-	-	-	-	-
Non-renewable secondary fuels		MJ, net calorific value	-	-	-	-	-
Net use of fresh water		**m^3**	1,26E-02	1,32E-02	1,26E-02	1,10E-02	1,77E-02

***Table 6**. The results from the LCA showing the resource consumption during module A1-A3 (cradle-to-gate) for each product of the Icopal Mono reinforced bitumen sheets.*

Waste production and output flows

1 m^2 Icopal Mono reinforced bitumen sheet for exposed roof waterproofing

Waste production

IMPACT CATEGORY	UNIT	Mono P	Mono PC	Mono PM	Mono PR	Mono Noxite
Hazardous waste disposed	kg	4,48E-03	4,47E-03	2,67E-03	2,65E-03	4,75E-03
Non-hazardous waste disposed	kg	9,70E-03	9,69E-03	7,4E-03	6,01E-03	1,6E-02
Radioactive waste disposed	kg	2,70E-04	2,70E-04	2,70E-04	2,70E-04	2,70E-04

Table 7. *The results from the LCA showing the waste generation during module A1-A3 (cradle-to-gate) for each product of the Icopal Mono reinforced bitumen sheets.*

Output flows

IMPACT CATEGORY	UNIT	Mono P	Mono PC	Mono PM	Mono PR	Mono Noxite
Components for reuse	kg	0	0	0	0	0
Materials for recycling	kg	1,68E-01	1,68E-01	1,67E-01	1,66E-01	1,68E-01
Materials for energy recovery	kg	3,74E-02	3,74E-02	3,74E-02	3,74E-02	3,74E-02
Energy recovery	MJ	0	0	0	0	0

Table 8. *The results from the LCA showing the output flows during module A1-A3 (cradle-to-gate) for each product of the Icopal Mono reinforced bitumen sheets.*

References

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