

Environmental Product Declaration



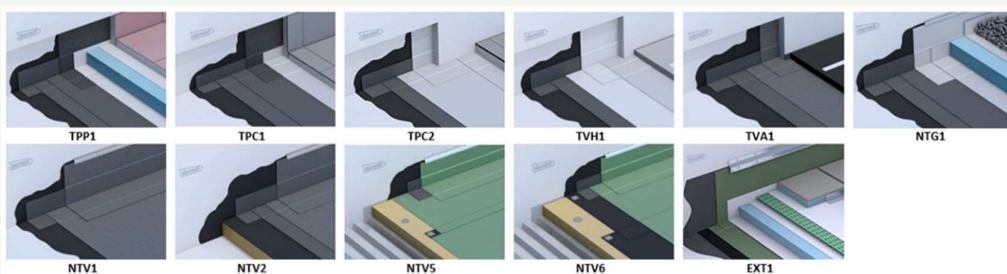
Compliant with ISO 14025 and UNE-EN 15804:2012+A2:2019

**WATERPROOFING SYSTEMS WITH BITUMINOUS
MEMBRANE: TPP1 / TPC1 / TPC2 / TVH1 / TVA1 / NTG1 /
NTV1 / NTV2 / NTV5 / NTV6 / EXT1.**

DANOSA, Derivados Asfálticos Normalizados, S.A.

Program:	The International EPD® System, www.environdec.com
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*An EPD should contain current information and be updated if conditions change.
Therefore, the stated validity is subject to continued registration and publication at
www.environdec.com.*



General information

Program information

Program:	The International EPD® System
Direction:	EPD International AB Box 210 60 SE-100 31 Stockholm Sweden
Web site:	www.environdec.com
E-mail:	info@environdec.com

CEN EN 15804 serves as the basis for the Product Category Rules (PCR).
Product Category Rule (PCR): Construction Products, PCR 2019:14, Version 1.11.
The PCR review was Performed by: The Technical Committee of the International EPD® System. Review chair: Claudia A. Peña, University of Concepción, Chile. The review panel can be contacted via www.environdec.com/contact
Independent verification of the declaration and information, according to ISO 14025:2010 <input type="checkbox"/> EPD process certification <input checked="" type="checkbox"/> EPD verification
Third Party Verifier : TECNALIA R&I Certification S.L. Auditor: Cristina Gazulla Santos Accredited by: ENAC. Accreditation no.125/C-PR283
The data tracking procedure during the validity of the EPD involves a third party verifier: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No

Construction product EPDs may not be comparable if they do not comply with EN 15804.

Environmental claims for products within the same product category from different programs may not be comparable.

The verifier and the operator of the program have no responsibility for the legality of the product.

Company information

Owner of the EPD: DANOSA, Derivados Asfálticos Normalizados, S.A

Contact: DANOSA SPAIN - +34 949 888 210 - info@danosa.com

DANOSA is a manufacturing company, specialized in integral solutions for sustainable construction. It has been in continuous activity since its foundation in 1964, having evolved through new products and systems, addressing and expanding geographies and supplied markets, with a distribution of sales between national and international markets of 50% respectively. It is considered as one of the reference companies in the Spanish and European market, with a global presence in more than 100 countries.

Thanks to this, DANOSA meets the needs of Building and Civil Engineering: asphalt waterproofing, synthetic waterproofing, liquid waterproofing, acoustic insulation, thermal insulation, mortars, drainage, geotextiles and skylights. In recent years it has been fully involved in the development of innovation and sustainability projects, adapting its solutions to comply with sustainable construction standards, maximizing the energy efficiency of buildings. In addition, it has ISO 9001 and ISO 14001 quality and environmental certifications, respectively.

Many of its products have Environmental Product Declarations (EPD) and are also integrated in the materials platform of the Green Building Council Spain, which allows them to score in projects with GREEN, LEED and BREEAM certification.

The company has also strengthened its business line dedicated to the recovery of materials and its commitment to the circular economy, which allows it to introduce recycled materials into production processes, making it possible for these wastes to become useful raw materials for the manufacture of new products.

This document will be used for B2B communication and may be considered global in scope.

Location of the production center: Polígono Industrial Sector 9, 19290 Fontanar (Guadalajara) Spain.

Product information

Product name: This Environmental Product Declaration covers the entire range of waterproofing systems with SBS sheets manufactured by DANOSA.

Product description: The waterproofing solutions with single or double layer bituminous membrane proposed by DANOSA are formed by the range of asphalt sheets of bitumen modified with elastomeric polymers type SBS.


These sheets are manufactured by calendering and are reinforced with a polyester fiber, reinforced polyester or fiberglass reinforcement. The sheets are plasticized on the lower layer and on the upper layer they can be plasticized or have a mineral self-protection with slate.


In the installation, the sheets will form the bituminous membrane that will give rise to the flat roof waterproofing system.


The function of the waterproofing systems is mainly to protect the building against water in its various forms: rain, humidity, snow and hail.


In addition, depending on the system, the solution makes it possible to ensure thermal insulation over time, to make the roof accessible to pedestrians and/or vehicles and/or to enable the use of vegetation systems on the roof. These complementary functions, which are provided by the insulation and the finish, have not been considered, nor has the use of the materials that provide this function.


The eleven systems included in this EPD and their main characteristics are shown below:


TPP1	FLAT ROOF FOR PRIVATE USE			
	Waterproofing: Adhered bituminous bilayer membrane (SBS)			
	Thermal insulation: Poliestireno extruido (XPS)			
	Coating: Pavement			
				Certification
				DIT N° 550R/16
TECHNICAL SPECIFICATIONS				
Function	Product	Description	Properties	Value
Support	ARGOSEC® M-25 Élite	Low-shrinkage projected structural plaster.	Performance	100 kg/m³
Primer	CURIDAN®	Aqueous bituminous bass primer.	Adherence	≥ 0.3 kg/m²
Waterproofing	GLASDAN® 30 P ELAST	Bituminous modified bitumen sheet (SBS) with fiberglass reinforcement and plastic film finish.	EN 13707: Bituminous sheets with reinforcement for roof waterproofing.	
Waterproofing	ESTERDAN® 40 P ELAST	Bituminous modified bitumen sheet (SBS) with polystyrene felt reinforcement and plastic film termination	EN 13707: Bituminous sheets with reinforcement for roof waterproofing.	
Separation	DANOFELT® PY 200	Nonwoven geotextile formed by polyester fibers.	Grammage	200 g/m²
Thermal insulation	DANOPREN® TR	Rigid extruded polystyrene sheets (XPS) with high compressive strength and minimal water absorption	Thermal conductivity (EN 12667)	λ = 0.033 – 0.037 W/m · K
Separation	DANOFELT® PY 300	Nonwoven geotextile formed by polyester fibers.	Grammage	300 g/m²
Protection	ARGOSEC® M-25 Elite	Low-shrinkage projected structural plaster.	Performance	40 kg/m²
Cementitious adhesive	ARGOCOLA® ELITE 500	C2TE S1 deformable cementitious adhesive.	Performance	6 kg/m²
Grouting	ARJUNT® UNIVERSAL	Ceramic grout CG2 AW	Performance	0.64 kg/m²

TPC1	FLAT WALKABLE ROOF FOR COMMON AREAS FOR PRIVATE USE			
	Waterproofing: Adhered bituminous bilayer membrane (SBS)			
	Coating: Pavement			
TECHNICAL SPECIFICATIONS				
Function	Product	Description	Properties	Value
Support	ARGOSEC® M-25 Élite	Low-shrinkage projected structural plaster.	Performance	100 kg/m³
Primer	CURIDAN®	Aqueous bituminous bass primer.	Adherence	≥ 0.3 kg/m²
Waterproofing	GLASDAN® 30 P ELAST	Bituminous modified bitumen sheet (SBS) with fiberglass reinforcement and plastic film finish.	EN 13707: Bituminous sheets with reinforcement for roof waterproofing.	
Waterproofing	POLYDAN® 180-40 P ELAST	Bituminous modified bitumen sheet (SBS) with high gram polyester felt reinforcement and plastic film finish.	EN 13707: Bituminous sheets with reinforcement for roof waterproofing.	
Anti-puncture	DANOFELT® PY 300	Nonwoven geotextile formed by fibers of polyester fibers.	Grammage	300 g/m²
Protection	ARGOSEC® M-25 Elite	Low-shrinkage projected structural plaster.	Performance	40 kg/m²
Cementitious adhesive	ARGOCOL® ELITE 500	C2TE S1 deformable cementitious adhesive.	Performance	6 kg/m²
Grouting	ARJUNT® UNIVERSAL	Ceramic grout CG2 AW	Performance	0.64 kg/m²

TPC2	FLAT WALKABLE ROOF FOR COMMON AREAS FOR PUBLIC USE				
	Waterproofing: Adhered bituminous bilayer membrane (SBS)				
	Coating: Pavement				
TECHNICAL SPECIFICATIONS					
Function	Product	Description	Properties	Value	
Support	ARGOSEC® M-25 Élite	Low-shrinkage projected structural plaster.	Performance	100 kg/m³	
Primer	CURIDAN®	Aqueous bituminous bass primer.	Adherence	≥ 0.3 kg/m²	
Waterproofing	GLASDAN® 30 P ELAST	Bituminous modified bitumen sheet (SBS) with fiberglass reinforcement and plastic film finish.	EN 13707: Bituminous sheets with reinforcement for roof waterproofing.		
Waterproofing	POLYDAN® 48 P PARKING	Modified bituminous bitumen sheet (SBS) with high gram polyester felt reinforcement and geotextile termination	EN 13707: Bituminous sheets with reinforcement for roof waterproofing. EN 14695: Bituminous sheets with reinforcement for waterproofing concrete bridge decks and other concrete surfaces for vehicular traffic.		
Separation	DANOFELT® PY 300	Nonwoven geotextile formed by fibers of polyester fibers.	Grammage	300 g/m²	
Protection	ARGOSEC® M-25 Elite	Low-shrinkage projected structural plaster.	Performance	40 kg/m²	
Cementitious adhesive	ARGOCOLA® ELITE 500	C2TE S1 deformable cementitious adhesive.	Performance	6 kg/m²	
Grouting	ARJUNT® UNIVERSAL	Ceramic grout CG2 AW	Performance	0.64 kg/m²	

TVH1	FLAT COVER FOR VEHICLES			
	Waterproofing: Adhered bituminous bilayer membrane (SBS)			
	Coating: Concrete running surface			
TECHNICAL SPECIFICATIONS				
Function	Product	Description	Properties	Value
Support	ARGOTEC® Cosmético R2	Non-structural repair mortar and surface surface protection of concrete.	Performance	5 kg/m³
Primer	CURIDAN®	Aqueous bituminous bass primer.	Adherence	≥ 0.3 kg/m²
Waterproofing	GLASDAN® 30 P ELAST	Bituminous modified bitumen sheet (SBS) with fiberglass reinforcement and plastic film finish.	EN 13707: Bituminous sheets with reinforcement for roof waterproofing.	
Waterproofing	POLYDAN® 48 P PARKING	Bituminous modified bitumen sheet (SBS) with polyester filter reinforcement and geotextile termination.	EN 13707: Bituminous sheets with reinforcement for roof waterproofing. roofing. EN 14695: Bituminous sheets with reinforcement for waterproofing concrete bridge decks and other concrete surfaces for vehicular traffic.	
Separation	DANOFELT® PY 200	Nonwoven geotextile formed by fibers of polyester fibers.	Grammage	200 g/m²

TVA1	FLAT COVER FOR VEHICLES			
	Waterproofing: Adhered bituminous bilayer membrane (SBS)			
	Coating: Asphalt agglomerate			Certification DIT N° 569R/16
TECHNICAL SPECIFICATIONS				
Function	Product	Description	Properties	Value
Support	ARGOTEC® Cosmético R2	Non-structural repair mortar and surface surface protection of concrete.	Performance	4 kg/m³
Primer	CURIDAN®	Aqueous bituminous bass primer.	Adherence	≥ 0.3 kg/m²
Waterproofing	GLASDAN® 30 P ELAST	Bituminous modified bitumen sheet (SBS) with fiberglass reinforcement and plastic film finish.	EN 13707: Bituminous sheets with reinforcement for roof waterproofing.	
Waterproofing	POLYDAN® 60 TF ELAST	Modified bituminous bitumen (SBS) with polyester filter pile and slate granule finish. slate granules.	EN 13707: Bituminous reinforcement sheets for roof waterproofing. roofing. EN 14695: Bituminous sheets with reinforcement for waterproofing concrete bridge decks and after concrete surfaces for vehicular traffic.	

NTG1	NON-TRAFFICABLE INVERTED FLAT ROOF			
	Waterproofing: Adhered bituminous bilayer membrane (SBS)			
	Thermal insulation: Extruded polystyrene (XPS)			Certification
	Coating: Gravel			DIT N° 550R/16
TECHNICAL SPECIFICATIONS				
Function	Product	Description	Properties	Value
Support	ARGOTEC® M-25 Elite	Structural plasters low-shrinkage sprayed plasters.	Performance	100 kg/m³
Primer	CURIDAN®	Aqueous bituminous bass primer.	Adherence	≥ 0.3 kg/m²
Waterproofing	GLASDAN® 30 P ELAST	Bituminous modified bitumen sheet (SBS) with fiberglass reinforcement and plastic film finish.	EN 13707: Bituminous sheets with reinforcement for roof waterproofing.	
Waterproofing	ESTERDAN® 40 P ELAST	Bituminous modified bitumen sheet (SBS) with polyester felt reinforcement and plastic film finish.	EN 13707: Bituminous sheets with reinforcement for roof waterproofing.	
Separation	DANOFELT® PY 200	Nonwoven geotextile formed by polyester fibers.	Grammage	200 g/m²
Thermal insulation	DANOPREN® TR	Rigid extruded polystyrene sheets (XPS) with high compressive strength and minimal water absorption	Thermal conductivity (EN 12667)	λ = 0,033 - 0,037 W/m · K
Filtration	DANOFELT® PY 200	Non-woven geotextile formed by polyester fibers.	Grammage	200 g/m²


NTV1

NON-TRAFFICABLE FLAT ROOF

Waterproofing: Single-ply bituminous adhered membrane (SBS)

Thermal insulation: Interior

Coating: Weathering film





Certification


DIT N° 550R/16

TECHNICAL SPECIFICATIONS

Function	Product	Description	Properties	Value
Support	ARGOTEC® M-25 Elite	Non-structural repair mortar and surface surface protection of concrete.	Performance	100 kg/m³
Primer	CURIDAN®	Aqueous bituminous bass primer.	Adherence	≥ 0.3 kg/m²
Waterproofing	ESTERDAN® PLUS 50/GP ELAST	Bituminous modified bitumen sheet (SBS) with polystyrene felt reinforcement and polystyrene granule finish pyramid granules	EN 13707: bituminous sheeting with reinforced bituminous sheets for roofing.	

NTV2	NON-TRAFFICABLE FLAT ROOF			
	Waterproofing: Adhered bituminous bilayer membrane (SBS)			
	Thermal insulation: Rock wool		Certification	
	Coating: Weathering film		DIT N° 550R/16	
TECHNICAL SPECIFICATIONS				
Function	Product	Description	Properties	Value
Support	ARGOTEC® M-25 Elite	Non-structural repair mortar and surface surface protection of concrete.	Performance	100 kg/m³
Thermal insulation	Rock wool	Rigid rock wool panels, finished with asphaltic watering on the mechanically fastened to the base substrate.	Conductivity thermal conductivity (EN 12667)	λ = 0.039 W/m-K
			Reaction to fire (EN 13501-1)	A1
Waterproofing	GLASDAN® 30 P ELAST	Bituminous modified bitumen (SBS) modified bitumen (SBS) with fiberglass fiberglass reinforcement and plastic film film.	EN 13707: bituminous sheeting with reinforced bituminous sheets for roof waterproofing	
Waterproofing	ESTERDAN® PLUS 40/GP ELAST	Bituminous modified bitumen sheet (SBS) with polyester filter reinforcement and slate granule finish. slate granules.	EN 13707: bituminous sheeting with reinforced bituminous sheets for roofing.	

NTV5	NON-TRAFFICABLE DECK COVER			
	Waterproofing: Mechanically adhered single-ply bituminous membrane (SBS)			
	Thermal insulation: Rock wool			Certification
	Coating: Weathering film			
TECHNICAL SPECIFICATIONS				
Function	Product	Description	Properties	Value
Vapor barrier	SELF-DA® PE	Self-adhesive bituminous film finished in a coextruded polyethylene film.	Water vapor diffusion resistance (EN 1398)	μ > 115000
Thermal insulation	Rock wool	Rigid rock wool panels, mechanically fastened to the base support.	Conductivity thermal conductivity (EN 12667)	λ = 0.039 W/m-K
			Reaction to fire (EN 13501-1)	A1
Waterproofing	POLYDAN® PLUS FM 50/GP ELAST	Bituminous modified bitumen sheet (SBS) with polyester filter reinforcement and a slate granule finish. slate granules	EN 13707: bituminous sheeting with reinforced bituminous sheets for waterproofing roofing.	
			European Guide ETAG006: Roof waterproofing systems with roof waterproofing systems with mechanically fastened flexible membranes.	

NTV6	NON-TRAFFICABLE DECK COVER			
	Waterproofing: Two-layer mechanically bound bituminous membrane (SBS)			
	Thermal insulation: Rock wool			Certification
	Coating: Weathering film			DIT N° 06/0062
TECHNICAL SPECIFICATIONS				
Function	Product	Description	Properties	Value
Vapor barrier	SELF-DAN® BTM	Self-adhesive bituminous film finished in a coextruded polyethylene film.	Vapor diffusion resistance water vapor diffusion (EN 13984)	μ > 115000
Thermal insulation	Rock wool	Rigid rock wool panels, mechanically fastened to the base support.	Conductivity thermal conductivity (EN 12667)	λ = 0.039 W/m-K
			Reaction to fire (EN 13501-1)	A1
Waterproofing	ESTERDAN® FM 30 P ELAST	Modified bituminous bitumen sheet (SBS) with polyester filter armor and plastic film termination.	EN 13707: Bituminous sheeting with reinforcement for roof sealing	
Waterproofing	ESTERDAN® PLUS 40/GP ELAST	Bituminous modified bitumen sheet (SBS) with polyester felt reinforcement and slate granule finish	European guideline ETAG006: Roof waterproofing systems with mechanically fastened flexible membranes	


EXT1

EXTENSIVE LANDSCAPED FLAT ROOF

Waterproofing: Adhered bituminous bilayer membrane (SBS)

Thermal insulation: Extruded polystyrene (XPS)

Coating: Extensive garden



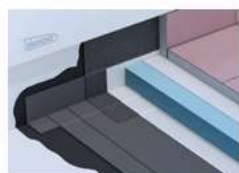
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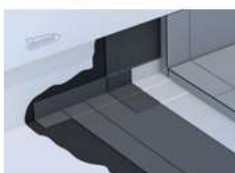
TECHNICAL SPECIFICATIONS

Function	Product	Description	Properties	Value
Support	ARGOSEC® M-25 Elite	Low shrinkage projected structural plaster.	Performance	100 kg/m³
Primer	CURIDAN®	Aqueous bituminous bass primer.	Adherence	≥ 0.3 kg/m²
Waterproofing	GLASDAN® 30 P ELAST	Bituminous modified bitumen sheet (SBS) with fiberglass reinforcement and plastic film finish.	EN 13707: Bituminous sheets with reinforcement for roof waterproofing.	
Waterproofing	ESTERDAN® PLUS 50/GP ELAST VERDE JARDIN	Bituminous modified bitumen sheet (SBS) with polyester felt reinforcement and slate granule finish.	EN 13707: Bituminous sheets with reinforcement for waterproofing of roofs. EN 13948: Resistance to root penetration.	
Separation	DANOFELT® PY 200	Nonwoven geotextile formed by fibers of polyester fibers.	Grammage	200 g/m²
Thermal insulation	DANOPREN® TR	Rigid extruded polystyrene sheets (XPS) with high compressive strength and minimal water absorption	Thermal conductivity (EN 12667)	λ = 0.033 – 0.037 W/m · K
Separation	DANOFELT® PY 200	Nonwoven geotextile formed by fibers of polyester fibers.	Grammage	200 g/m²
Retention and drainage	DANODREN® R-20	Nodular high-density polyethylene (HDPE) retaining film	Drainage and retention (DIN 53495)	D: 2.5 l/m · s
				R: 5 l/m²
Filtration	DANOFELT® PY 200	Non-woven fabric made from polyester fibers	Grammage	200 g/m²

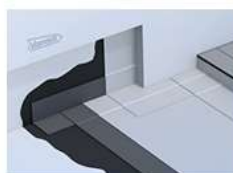
Waterproofing systems		TPP1	TPC1	TPC2	TVH1	TVA1	NTG1	NTV1	NTV2	NTV5	NTV6	EXT1
		Private Two-Layer Walkable Adhered System	Private Two-Layer Walkable Adhered System	Public Two-Layer Walkable Adhered System	Two-Layer Adhered System for Concrete Vehicles	Asphaltic Agglomerate Vehicle Two-Layer Adhered Adhesive System	Non-Trafficable Two-Layer Adhered System Gravel	Non-Trafficable Self-Protecting Single-Layer Adhered System	Non-Trafficable Self-Protecting Two-Layer Adhered System	Mechanically Fastened Non-Trafficable Single-Layer Self-Protecting System	Mechanically Fastened Two-Layer Non-Trafficable Self-Protecting System	Two-Layer Adhered Landscaping System
Top sheet	Name	ESTERDAN 40 P ELAST	POLYDAN 180-40 P ELAST	POLYDAN 48 P PARKING	POLYDAN 48 P PARKING	POLYDAN 60 TF ELAST	ESTERDAN 40 P ELAST	ESTERDAN PLUS 50/GP ELAST	ESTERDAN PLUS 40/GP ELAST	POLYDAN PLUS FM 50/GP ELAST	ESTERDAN PLUS 40/GP ELAST	ESTERDAN PLUS 50/GP ELAST GREEN JARDIN
	Weight (kg/m ²)	4	4	4.8	4.8	6	4	5	4	5	4	5
Bottom sheet	Name	GLASDAN 30 P ELAST	GLASDAN 30 P ELAST	GLASDAN 30 P ELAST	GLASDAN 30 P ELAST	GLASDAN 30 P ELAST	GLASDAN 30 P ELAST	-	GLASDAN 30 P ELAST	-	ESTERDAN FM 30 P ELAST	GLASDAN 30 P ELAST
	Weight (kg/m ²)	3	3	3	3	3	3	-	3	-	3	3
Amount of film used per system (m ² /m ²)		1.08	1.08	1.08	1.08	1.08	1.08	1.12	1.12	1.12	1.12	1.08
Weight of bituminous membrane (kg/m ²)		7.96	7.96	8.284	8.284	10.12	7.96	6	8.24	5.6	7.84	9.04
Type of installation		Torch bonding	Torch bonding	Torch bonding	Torch bonding	Torch bonding	Torch bonding	Torch bonding	Torch bonding	Mechanical fastening and torch bonding in joints	Mechanical attachment to the substrate and torch bonding between sheets	Torch bonding



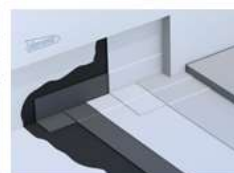
TPP1



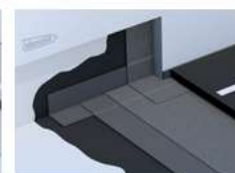
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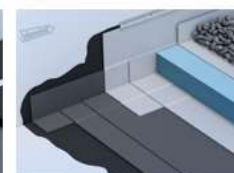
TPC2



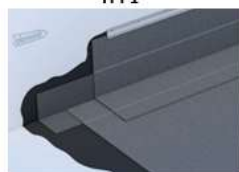
TVH1



TVA1



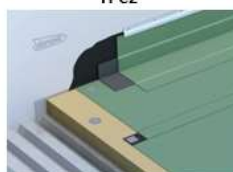
NTG1



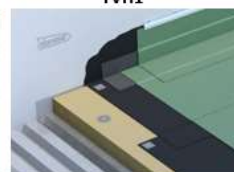
NTV1



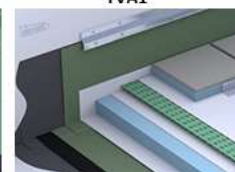
NTV2



NTV5



NTV6



EXT1

CPC Code: 5453 Waterproofing and roofing services.

LCA Information

Declared unit:

- 1 m² of bituminous membrane installed with an expected service life of 50 years.

The conversion factor to mass per square meter is:

- 7.96 kg/m² TPP1, TPC1 y NTG1.
- 8.284 kg/m² TPC2 y TVH1.
- 8.24 kg/m² NTV2.
- 9.04 kg/m² EXT1.
- 6 kg/m² NTV1.
- 5.60 kg/m² NTV5.
- 7.84 kg/m² NTV6
- 10.12 kg/m² TVA1.

Other functions of the systems, such as ensuring thermal insulation over time, making the roof accessible to pedestrians and vehicles and/or enabling the use of vegetation systems on the roof, are not included. These complementary functions have not been considered.

Reference service life: The service life of the product is considered to be the same as that of the building as it is a product that is incorporated into the building's installations, i.e., 50 years.

Temporal representativeness: The primary data were obtained from the production center and refer to the year 2021.

Databases and software used: Ecoinvent v3.8 (allocation, cut-off by classification) and SimaPro 9.3.

Description of the system boundaries: The EPD covers modules A1-A3, A4-A5, B1-B7, C1-C4 and D.

Modularity and polluter payer principles have been followed. The following processes have been excluded:

- Manufacture of equipment used in production, buildings or any other capital goods;
- The transportation of personnel to the plant;
- Transportation of personnel within the plant;
- Research and development activities;
- Long-term emissions.

95% of all mass and energy inputs and outputs of the central system, identified in the life cycle inventory included in this report, have been included. Those inputs and outputs, for which data are not available, that together represent less than 5% of the mass, such as packaging waste of auxiliary materials, have not been considered.

Whenever possible, allocation has been avoided. Where necessary (energy, waste generation) a mass allocation has been used, according to the weight in kg of the product. The consumption of the specific process has been measured with specific meters.

All primary data were obtained from Danosa. Secondary data were obtained from the Ecoinvent v3.8 database.

The scenarios included are currently in use and are representative of one of the most likely alternatives.

A1. Extraction of raw materials

Extraction and processing of natural resources and manufacture of raw materials: bitumen, SBS polymer, carbonate, ash, polyester, bitumen emulsion, mineral shale and others.

This stage includes the production of energy consumed in the manufacturing stage (A3).

A2. Transportation

Transport of all raw materials considered in module A1, from the extraction, production and processing site to the factory gate.

A3. Manufacturing

This module considers all bituminous sheet manufacturing processes, including the consumption of packaging materials, as well as the treatment of the waste generated.

The first part of the line is the armor accumulator trolley. Once it arrives at the tank, if it is a product with glass veil reinforcement, it is not pre-impregnated and in the case of polyester felt reinforcement, pre-impregnation is carried out.

Then we go to the impregnation tank, in the thickness calendar the thickness of the product is adjusted and the cooling process begins. The lower finishing plastic is placed.

In the case of plastic/plastic sheets, the upper termination plastic is placed and in the case of self-protected sheets, slate or geotextile.

Finally, the film moves along the cooling rollers until it reaches the film accumulator carriage, where it is wound and palletized.

The primary data used were obtained from the production plant itself and are representative of Danosa's bituminous sheet production.

A4. Distribution

The scenarios included are currently in use and are representative of one of the most likely alternatives. An additional statement of representative mixtures is allowed for the relevant region.

Transport of the product from the production plant to the installation site.

PARAMETER	VALUE (expressed in declared unit)	
Type of fuel and consumption of the vehicle or type of means of transport used	National distribution: 16-32 ton Euro 4 truck with a diesel consumption of 0.38 liters per km.	International distribution: 16-32 ton Euro 4 truck with a diesel consumption of 0.38 liters per km and Transoceanic ship.
Distance	National and international distribution: 1.086 km (on road)	National and international distribution: 934 km (by ship)
Capacity of use (including return transport without load)	Assumed % in Ecoinvent database	
Bulk density of the product being transported: sheets	1.100 kg/m ³	
Volume use capacity factor	1 (default)	

A5. Installation:

This module includes the consumption of auxiliary materials (in addition to the product), as well as the management of possible waste generated during this information module.

The surface of the base substrate must be resistant, uniform, smooth, clean, dry and free of foreign bodies. In the case of thermal insulation, the boards should be placed butt-to-butt and with no gaps between boards greater than 0.5 cm.

Two-ply membrane bottom sheet, adhered system with heavy protection and self-protected two-ply membrane bottom sheet. The adhesion of the membrane to the substrate is done with a blowtorch.

Upper sheet of two-ply waterproofing membranes with heavy protection. The sheet is laid out in the same direction as the bottom sheet, moving the overlap line approximately halfway along the roll. The sheet is fully welded to the bottom sheet with a blowtorch.

The calculation takes into account a loss of about 9% to 12%.

PARAMETER	VALUE (expressed in declared unit)	
Secondary materials for installation:	Curidan®: 0.4 kg in all systems except mechanically fastened systems (TPP1, TPC1, TPC2, TVH1, TVA1, NTG1, NTV1, NTV2, EXT1)	Galvanized steel mechanical fasteners: 0.125 kg in mechanically fastened systems (NTV5, NTV6)
Consumption of other resources	The following are considered negligible	
Quantitative description of the type of energy (regional mix) and its consumption during the installation process.	Propane gas: <ul style="list-style-type: none"> 0.3 kg/m² in the non-mechanically fastened two-layer systems (TPP1, TPC1, TPC2, TPC2, TVH1, TVA1, NTG1, NTV2, EXT1). 0.15 kg/m² in the non-mechanically fastened single-layer (NTV1) and mechanically fastened two-layer (NTV6) systems. 0.015 kg/m² in the mechanically fastened monolayer system (NTV5). 	
Waste of materials on site, before processing of waste generated during installation of the product (packaging and installation waste)	TPP1, TPC1, NTG1, NTV2, NTV6: <ul style="list-style-type: none"> Paper/cardboard: 3.87E-02 kg/m² Plastic film: 8.37E-03 kg/m² Seals/strips: 1.60E-03 kg/m² TPC2, TVH1, TVA1:	

PARAMETER	VALUE (expressed in declared unit)
	<ul style="list-style-type: none"> Paper/cardboard: 4.66E-02 kg/m² Plastic film: 1.01E-03 kg/m² Seals/strips: 1.93E-03 kg/m² <p>NTV1, NTV5:</p> <ul style="list-style-type: none"> Paper/cardboard: 2.77E-02 kg/m² Plastic film: 6.00E-03 kg/m² Seals/strips: 1.15E-03 kg/m² <p>EXT1:</p> <ul style="list-style-type: none"> Paper/cardboard: 4.42E-02 kg/m² Plastic film: 9.57E-03 kg/m² Seals/strips: 1.83E-03 kg/m²
Direct emissions to air, soil or water	The following are considered negligible

B. Stage of use

The sheets are classified as A+ according to Decree No. 2011-321 of March 23, 2011, of the French Ministry of Ecology, Sustainable Development, Transport and Housing concerning volatile organic compounds (VOC's). Therefore, for waterproofing solutions, module B1 is not considered relevant.

Maintenance (B2)

The product does not require any maintenance during its service life (50 years).

Repair (B3)

The product does not require any type of repair during service life (50 years).

Substitution (B4)

The product does not require any type of substitution during service life (50 years).

Rehabilitation (B5)

The product does not require any type of rehabilitation during service life (50 years).

Energy use in service (B6)

The product does not require any type of energy consumption during service life (50 years).

Water use in service (B7)

The product does not require any type of water consumption during service life (50 years).

Demolition (C1)

It is considered a joint demolition of the building, so the contribution of the concrete demolition of the bituminous sheets evaluated is not considered relevant.

Transport (C2)

Once the product is uninstalled, it is transported 50 km in 7.5-16 ton trucks from the construction site to the landfill.

Treatment of waste for reuse, recovery or recycling (C3)

In this case, the electricity consumption of the waste sorting facilities is considered.

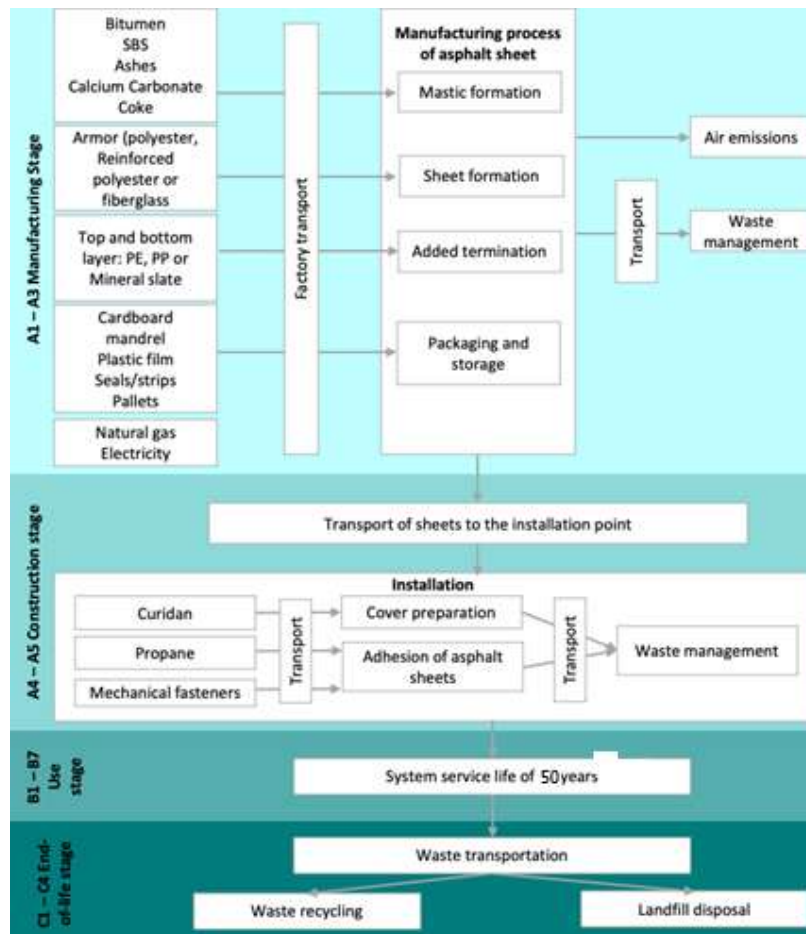
Final elimination (C4)

Part of the system's waste (product and auxiliary material) is considered to be deposited in a landfill.

PARAMETER	VALUE (expressed in declared unit)
Waste collection process specified by type	TPP1, TPC1, NTG1: 7.96 kg/m ² TPC2, TVH1: 8.284 kg/m ² TVA1: 10.12 kg/m ² NTV1: 6 kg/m ² NTV2: 8.24 kg/m ² NTV5: 5.6 kg/m ² NTV6: 7.84 kg/m ² EXT1: 9.04 kg/m ²
Recovery system specified by type	15% in mass to recycling.
Specified discharge by type	85 % to landfill.
Assumptions for scenario development	The waste from demolition of the products is transported 50 km by 7.5-16 ton Euro 4 trucks to the final treatment site or deposit.

Benefits of recycling (module D)

For this module, the benefits of recycling the bitumen contained in the bituminous membrane, which avoids the production of virgin primary bitumen, have been considered.



Additional information

- The life cycle analysis study has been carried out by DANOSA with the technical support of Marcel Gómez Consultoría Ambiental.
- The study covers a minimum of 95% of the materials and energy for each module evaluated, and at least 99% of the total use of materials and energy for each unitary process.
- More product information: www.danosa.es
- The quality of the input data has been assessed according to its technological, temporal and geographical coverage. The representativeness of the selected processes is considered to be good.

Reported modules, geographic scope, specific data and variation of data

	Product Stage					Construct ion Stage	Stage of Use							End-of-life stage				Resource recovery stage	
	Supply of Raw Materials	Transportation	Manufacturing	Transportation	Construction - Installation		Use	Maintenance	Repair	Replacement	Rehabilitation	Operational Energy Use	Operational Water Use	Deconstruction - demolition	Transportation	Waste Treatment	Waste Disposal	Reuse Potential - Recovery - Recycling.	
Module	A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D		
Declared modules	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		
Geograph ical location	ES	ES	ES	GLO	GL O	GL O	GL O	GL O	GL O	GL O	GL O	GL O	GL O	GLO	GLO	GLO	GLO		
Specific data	>90% GWP-GHG					-	-	-	-	-	-	-	-	-	-	-	-		
Variation - products	Variation of declared impact products <10% - for each product group.					-	-	-	-	-	-	-	-	-	-	-	-		

Content information

WATERPROOFING SYSTEMS

Sheets (1m ²)	ESTERDAN 40 P ELAST	ESTERDAN FM 30 P ELAST	ESTERDAN PLUS 40/GP ELAST	ESTERDAN PLUS 50/GP ELAST	ESTERDAN PLUS 50/GP ELAST GREEN JARDIN	GLASDAN 30 P ELAST	POLYDAN 180-40 P ELAST	POLYDAN 48 P PARKING	POLYDAN 60 TF ELAST	POLYDAN PLUS FM 50/GP ELAST
Mastic	96,92%	91,16%	66,87%	72,84%	72,84%	92,91%	92,64%	92,65%	76,09%	72,45%
Polyethylene	0,58%	0,70%	0,55%	0,47%	0,47%	0,68%	0,56%	0,57%	0,40%	0,47%
Polyester Resin	1,77%	2,26%	1,70%	1,37%	1,37%	3,97%	1,71%	1,64%	1,14%	1,37%
Fiberglass	0,00%	5,17%	3,40%	3,12%	3,12%	0,00%	4,39%	4,21%	3,76%	3,52%
Polypropylene	0,02%	0,02%	0,02%	0,02%	0,02%	0,02%	0,02%	0,03%	0,02%	0,02%
Stone	0.00%	0.00%	27.31%	21.85%	21.85%	0.00%	0.00%	0.00%	18.22%	21.85%
Lubricating Oils	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Linerboard	0.56%	0.55%	0.55%	0.55%	0.55%	0.55%	0.55%	0.69%	0.50%	0.55%

Packaging materials	Weight, kg	Weight (% with respect to product)
Pallet	7.98E-03	0.085%
Cardboard	2.95E-03	0.031%
Film	6.38E-04	0.007%

Components of the product (average)	Weight, kg	Post-consumer recycled material (%)	Renewable material (%)
Bitumen	45% a 50%	22.50%	0%
SBS	3 a 5.00%	0%	0%
LDPE	1.00%	100%	0%
Coke	4.00%	0%	0%
Calcium carbonate	34.00%	0%	0%
Filling	12.00%	100%	0%
Total weight	4.33	17.99%	0%

The bituminous sheets contain 17.99% of recycled material in the mastic. Specifically, 18.72% of the bitumen and 100% of the ash is recycled material. In addition, those membranes with polyester reinforcement contain 50% recycled polyester.

The origin of the recycled materials is as follows: Fluxant: recycled oil compound derived from bitumen. Marpol: recovered bitumen from tank cleaning. Recycled LDPE. Biomass ash.

No substance in the product above 0.10% by weight is present on the "Candidate List of Potentially Hazardous Substances (SVHC) for authorization under REACH legislation.

Environmental information

The results are relative expressions and do not predict impacts on endpoint categories, exceedance of certain levels, safety margins or risks. The calculation and impact methodologies are in accordance with UNE-EN 15804:2014+A2:2020 and the PCR, described at <https://www.environdec.com/resources/indicators>.

TVA1 SYSTEMS. Two-Layer Adhered Vehicle Asphalt Agglomerate Systems | NTV6. Mechanically Adhered Two-Layer Non-Traffic Pavement Self-Protecting Systems | TPC1. Public Walkable Two-Layer Adhered Systems | TPC2. Public Trafficable Two-Layer Adhered Systems | TVH1. Adhered Two-Layer Adhesive Vehicle Concrete Systems

Environmental impacts

Indicator	Unit	Results per declared unit															
		Manufacturing	Construction			Use							End-of-life				Module
		A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D	
Climate change - fossil (GWP-fossil)	kg CO2 eq	6.32E+00	3.18E-01	1.46E+00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.24E-01	0.00	1.26E+00	-1.27E+00	
Climate change - biogenic (GWP-biogenic)	kg CO2 eq	4.22E-03	3.19E-04	1.39E-03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.01E-04	0.00	1.22E-03	0.00E+00	
Climate change - land use and land use changes (GWP-luluc)	kg CO2 eq	1.50E-02	1.16E-04	3.32E-04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	8.78E-05	0.00	1.84E-05	0.00E+00	
Climate change - total (GWP-total)	kg CO2 eq	6.34E+00	3.18E-01	1.46E+00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.24E-01	0.00	1.27E+00	-1.27E+00	
Ozone layer depletion (ODP)	kg CFC11 eq	7.16E-07	7.57E-08	1.05E-07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.18E-08	0.00	2.67E-08	0.00E+00	
Acidification (AP)	mol H+ eq	3.84E-02	1.45E-03	3.83E-03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	9.08E-04	0.00	1.22E-03	-1.02E-02	
Eutrophication, freshwater (EP-freshwater)	kg P eq	5.89E-05	2.16E-06	1.07E-05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.57E-06	0.00	6.39E-07	0.00E+00	
Eutrophication, marine water (EP-marine)	kg N eq	6.72E-03	4.31E-04	1.04E-03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.71E-04	0.00	1.07E-03	-1.92E-03	
Eutrophication, terrestrial (EP-terrestrial)	mol N eq	7.39E-02	4.76E-03	1.14E-02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.99E-03	0.00	2.62E-03	-2.11E-02	
Photochemical ozone formation (POCP)	kg NMVOC eq	2.13E-02	1.51E-03	3.84E-03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	9.15E-04	0.00	1.06E-03	-5.35E-03	
Depletion of abiotic resources - minerals and metals (ADP - minerals & metals) *	kg Sb eq	1.57E-05	7.25E-07	4.83E-06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	7.78E-07	0.00	2.57E-07	0.00E+00	
Depletion of abiotic resources - fossil fuels (ADP-fossil) *	MJ	2.66E+02	4.94E+00	2.84E+01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.38E+00	0.03	1.94E+00	-1.47E+02	
Water consumption (WDP) *	m3 depriv.	4.94E+00	1.69E-02	5.96E-02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.01E-02	0.00	9.37E-03	-1.97E-02	

* Disclaimer: The results of this Environmental Impact Indicator should be used with caution as the uncertainties of these results are high or experience with the indicator is limited.

* The additional environmental indicators of EN 15804:2012+A2:2019 are not declared in this EPD.

Indicator	Unit	Results per declared unit														
		Manufac turing	Construction		Use							End-of-life				Module
		A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Global Warming Potential GWP-GHG ¹	kg CO2 eq	6.16E+00	3.15E-01	1.42E+00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.22E-01	0.00	1.02E+00	- 1.23E+00

Use of resources

Indicator	Unit	Results per declared unit														
		Manufacturing	Construction		Use							End-of-life				Module
		A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Renewable primary energy use excluding renewable primary energy resources used as raw material	MJ	6.13E+00	6.26E-02	2.86E-01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.77E-02	0.00	9.82E-02	0.00E+00
Use of renewable primary energy used as raw material	MJ	0.00E+00	0.00E+00	0.00E+00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00E+00	0.00	0.00E+00	0.00E+00
Total use of renewable primary energy (primary energy and renewable primary energy resources used as raw material)	MJ	6.13E+00	6.26E-02	2.86E-01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.77E-02	0.00	9.82E-02	0.00E+00
Non-renewable primary energy use, excluding non-renewable primary energy resources used as raw materials	MJ	2.84E+02	5.25E+00	3.07E+01	0.00	0.00	0.03	0.00	0.00	0.00	0.00	0.00	3.59E+00	0.00	2.06E+00	-1.56E+02
Use of non-renewable primary energy used as raw material	MJ	2.21E-01	0.00E+00	0.00E+00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00E+00	0.00	0.00E+00	0.00E+00
Total non-renewable primary energy use (primary energy and renewable primary energy resources used as raw material)	MJ	2.84E+02	5.25E+00	3.07E+01	0.00	0.00	0.03	0.00	0.00	0.00	0.00	0.00	3.59E+00	0.00	2.06E+00	-1.56E+02
Use of secondary materials	kg	0.00E+00	0.00E+00	0.00E+00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00E+00	0.00	0.00E+00	0.00E+00
Use of renewable secondary fuels	MJ	0.00E+00	0.00E+00	0.00E+00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00E+00	0.00	0.00E+00	0.00E+00

¹ The indicator includes all greenhouse gases included in GWP-total but excludes the uptake and emissions of biogenic carbon dioxide and biogenic carbon stored in the product. Therefore, this indicator is almost equal to the GWP indicator originally defined in EN 15804:2012+A1:2013.

Use of non-renewable secondary fuels	MJ	0.00E+00	0.00E+00	0.00E+00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00E+00	0.00	0.00E+00	0.00E+00
Net use of freshwater resources	m³	1.11E-01	5.85E-04	1.93E-03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.77E-04	0.00	2.48E-03	-4.59E-04

Waste generation and outflows

Waste generation

Indicator	Unit	Results per declared unit															
		Manufacturing	Construction			Use							End-of-life				Module
		A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D	
Hazardous waste disposed	kg	7.83E-05	1.19E-05	1.87E-05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	8.83E-06	0.00	2.33E-06	0.00E+00	
Non-hazardous waste disposed	kg	9.53E-01	4.57E-01	7.18E-02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.74E-01	0.00	8.61E+00	0.00E+00	
Radioactive waste disposed	kg	2.46E-04	3.35E-05	1.34E-05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.29E-05	0.00	1.26E-05	0.00E+00	

Outflows

Indicator	Unit	Results per declared unit															
		Manufacturing	Construction			Use							End-of-life				Module
		A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D	
Components for reuse	kg	0.00E+00	0.00E+00	0.00E+00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00E+00	0.00	0.00E+00	0.00	
Recycling materials	kg	8.91E+00	0.00E+00	0.00E+00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00E+00	0.00	0.00E+00	0.00	
Materials for energy recovery (energy recovery)	kg	0.00E+00	0.00E+00	0.00E+00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00E+00	0.00	0.00E+00	0.00	
Energy exported electricity	MJ	0.00E+00	0.00E+00	0.00E+00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00E+00	0.00	0.00E+00	0.00	
Energy exported thermal	MJ	0.00E+00	0.00E+00	0.00E+00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00E+00	0.00	0.00E+00	0.00	

Biogenic carbon content information

Results per declared unit		
Biogenic carbon content information	Unit	Quantity
Biogenic carbon content in the product	kg C	0.00E+00
Biogenic carbon content in the enclosed packaging	kg C	5.08E-02

Note: 1 kg of biogenic carbon is equivalent to 44/12 kg CO₂.

During the life cycle, the impact is spread over the product, distribution, installation and end-of-life stages.

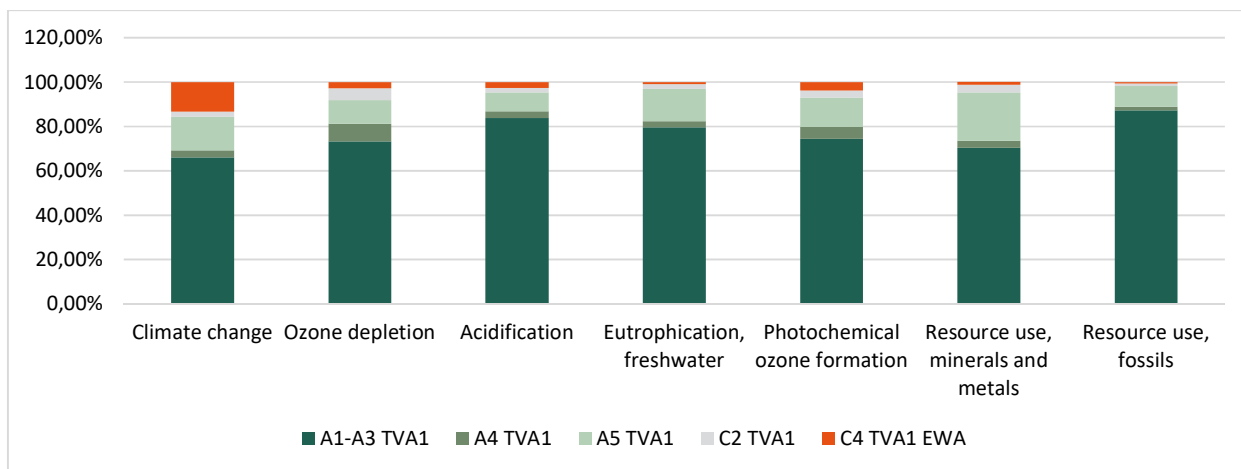
1 m² of bituminous membrane that make up the NTV6 systems (has greenhouse gas emissions of 5.13 kg CO₂ eq), representing the best scenario within these reference systems and finally the TVA1 system has greenhouse gas emissions of 6.34 kg CO₂ eq, being the worst scenario for which the following results are presented:

The Product Stage (A1-A3) is the life cycle stage with the highest impact for the 7 impact categories, with more than 66% (Climate Change) and up to 80% for the Eutrophication category.

The distribution of the product (A4) implies that the stage accounts for up to 8% of the impact for the Ozone Layer Depletion (ODP) category.

The installation stage (A5), which requires propane and bitumen emulsion consumption, has a relevant impact, ranging from 8% for Acidification to 22% for the Depletion of abiotic resources, elements category.

The end-of-life stage modules (C2, C3 and C4) have a maximum impact of 13% for the Climate Change (GWP) category due to the impact of the bituminous waste landfill.



For the rest of the waterproofing systems, the impact results follow the same trend.

NTV5. Mechanically Adhered Non-Transitable Single-Layer Self-Protecting Mechanically Systems NTV1. Non-Trafficable Self-Protecting Single-Layer Adhered Systems

Environmental impacts

Indicator	Unit	Results per declared unit														
		Manufacturing	Construction		Use							End-of-life				Module
		A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Climate change - fossil (GWP-fossil)	kg CO2 eq	3.51E+00	5.74E-02	1.37E+00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.24E-01	0.00	7.00E-01	-6.42E-01
Climate change - biogenic (GWP-biogenic)	kg CO2 eq	2.99E-03	5.84E-05	5.60E-03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.11E-04	0.00	6.75E-04	0.00E+00
Climate change - land use and land use changes (GWP-luluc)	kg CO2 eq	7.98E-03	2.06E-05	8.46E-04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.86E-05	0.00	1.02E-05	0.00E+00
Climate change - total (GWP-total)	kg CO2 eq	3.52E+00	5.75E-02	1.38E+00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.24E-01	0.00	7.00E-01	-6.42E-01
Ozone layer depletion (ODP)	kg CFC11 eq	3.98E-07	1.37E-08	8.18E-08	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.86E-08	0.00	1.48E-08	0.00E+00
Acidification (AP)	mol H+ eq	2.08E-02	2.39E-04	5.58E-03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.02E-04	0.00	6.75E-04	-5.19E-03
Eutrophication, freshwater (EP-freshwater)	kg P eq	3.55E-05	3.92E-07	3.14E-05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	8.68E-07	0.00	3.54E-07	0.00E+00
Eutrophication, marine water (EP-marine)	kg N eq	3.68E-03	7.24E-05	1.10E-03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.50E-04	0.00	5.94E-04	-9.76E-04
Eutrophication, terrestrial (EP-terrestrial)	mol N eq	4.05E-02	7.99E-04	1.24E-02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.65E-03	0.00	1.45E-03	-1.07E-02
Photochemical ozone formation (POCP)	kg NMVOC eq	1.18E-02	2.57E-04	4.03E-03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.06E-04	0.00	5.86E-04	-2.72E-03
Depletion of abiotic resources - minerals and metals (ADP – minerals & metals) *	kg Sb eq	1.04E-05	1.32E-07	2.16E-05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.30E-07	0.00	1.42E-07	0.00E+00
Depletion of abiotic resources - fossil fuels (ADP-fossil) *	MJ	1.39E+02	8.94E-01	1.50E+01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.87E+00	0.02	1.07E+00	-7.48E+01
Water consumption (WDP) *	m3 depriv.	2.63E+00	3.08E-03	2.53E-01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.60E-03	0.00	5.18E-03	-1.00E-02

* Disclaimer: The results of this Environmental Impact Indicator should be used with caution as the uncertainties of these results are high or experience with the indicator is limited.

* The additional environmental indicators of EN 15804:2012+A2:2019 are not declared in this EPD.

Indicator	Unit	Results per declared unit														
		Manufac turing	Construction		Use							End-of-life				Module
		A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Global Warming Potential GWP-GHG ²	kg CO2 eq	3.41E+00	5.68E-02	1.34E+00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.23E-01	0.00	5.66E-01	-6.22E-01

Use of resources

Indicator	Unit	Results per declared unit														
		Manufactur ing	Construction		Use							End-of-life				Module
			A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4
Renewable primary energy use excluding renewable primary energy resources used as raw material	MJ	3.32E+00	1.14E-02	1.91E+00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.64E-02	0.00	5.43E-02	0.00E+00
Use of renewable primary energy used as raw material	MJ	0.00E+00	0.00E+00	0.00E+00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00E+00	0.00	0.00E+00	0.00E+00
Total use of renewable primary energy (primary energy and renewable primary energy resources used as raw material)	MJ	3.32E+00	1.14E-02	1.91E+00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.64E-02	0.00	5.43E-02	0.00E+00
Non-renewable primary energy use, excluding non-renewable primary energy resources used as raw materials	MJ	1.49E+02	9.50E-01	1.62E+01	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	1.99E+00	0.00	1.14E+00	-7.94E+01
Use of non-renewable primary energy used as raw material	MJ	2.21E-01	0.00E+00	0.00E+00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00E+00	0.00	0.00E+00	0.00E+00
Total non-renewable primary energy use (primary energy and renewable primary energy resources used as raw material)	MJ	1.49E+02	9.50E-01	1.62E+01	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	1.99E+00	0.00	1.14E+00	-7.94E+01
Use of secondary materials	kg	0.00E+00	0.00E+00	0.00E+00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00E+00	0.00	0.00E+00	0.00E+00
Use of renewable secondary fuels	MJ	0.00E+00	0.00E+00	0.00E+00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00E+00	0.00	0.00E+00	0.00E+00
Use of non-renewable secondary fuels	MJ	0.00E+00	0.00E+00	0.00E+00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00E+00	0.00	0.00E+00	0.00E+00

² The indicator includes all greenhouse gases included in GWP-total but excludes the uptake and emissions of biogenic carbon dioxide and biogenic carbon stored in the product. Therefore, this indicator is almost equal to the GWP indicator originally defined in EN 15804:2012+A1:2013.

Indicator	Unit	Results per declared unit														
		Manufactur ing	Construction		Use							End-of-life				Module
		A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Net use of freshwater resources	m ³	5.96E-02	1.06E-04	6.95E-03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.09E-04	0.00	1.38E-03	-2.33E-04

Waste generation and outflows

Waste generation

Indicator	Unit	Results per declared unit														
		Manufacturing	Construction		Use							End-of-life				Module
		A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Hazardous waste disposed	kg	4.43E-05	2.16E-06	1.42E-05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.89E-06	0.00	1.29E-06	0.00E+00
Non-hazardous waste disposed	kg	5.62E-01	8.37E-02	7.34E-01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	9.63E-02	0.00	4.77E+00	0.00E+00
Radioactive waste disposed	kg	1.34E-04	6.06E-06	2.40E-05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.27E-05	0.00	6.99E-06	0.00E+00

Outflows

Indicator	Unit	Results per declared unit														
		Manufacturing	Construction		Use							End-of-life				Module
		A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Components for reuse	kg	0.00E+00	0.00E+00	0.00E+00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00E+00	0.00	0.00E+00	0.00
Recycling materials	kg	4.93E+00	0.00E+00	0.00E+00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00E+00	0.00	0.00E+00	0.00
Materials for energy recovery (energy recovery)	kg	0.00E+00	0.00E+00	0.00E+00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00E+00	0.00	0.00E+00	0.00
Energy exported electricity	MJ	0.00E+00	0.00E+00	0.00E+00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00E+00	0.00	0.00E+00	0.00
Energy exported thermal	MJ	0.00E+00	0.00E+00	0.00E+00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00E+00	0.00	0.00E+00	0.00

Biogenic carbon content information

Results per declared unit		
Biogenic carbon content information	Unit	Quantity
Biogenic carbon content in the product	kg C	0.00E+00
Biogenic carbon content in the enclosed packaging	kg C	5.52E-02

Note: 1 kg of biogenic carbon is equivalent to 44/12 kg CO₂.

EXT1. Adhered Two-Layer Landscaped Systems | TPP1. Private Walkable Two-Layer Adhered Systems | NTG1. Non-Trafficable Gravel Two-Layer Gravel Adhesive Systems | NTV2. Self-protected Non-Trafficable | NTV2.Two-Layer Adhered Systems

Environmental impacts

Indicator		Results per declared unit																
		Unit	Manufacturing	Construction			Use							End-of-life				Module
			A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D	
Climate change - fossil (GWP-fossil)	kg CO2 eq	5.67E+00	2.89E-01	1.46E+00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00E-01	0.00	1.13E+00	-1.11E+00		
Climate change - biogenic (GWP-biogenic)	kg CO2 eq	3.45E-03	2.92E-04	1.39E-03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.80E-04	0.00	1.09E-03	0.00E+00		
Climate change - land use and land use changes (GWP-luluc)	kg CO2 eq	1.47E-02	1.05E-04	3.32E-04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	7.85E-05	0.00	1.64E-05	0.00E+00		
Climate change - total (GWP-total)	kg CO2 eq	5.69E+00	2.90E-01	1.46E+00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00E-01	0.00	1.13E+00	-1.11E+00		
Ozone layer depletion (ODP)	kg CFC11 eq	6.53E-07	6.90E-08	1.05E-07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.62E-08	0.00	2.38E-08	0.00E+00		
Acidification (AP)	mol H+ eq	3.35E-02	1.26E-03	3.83E-03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	8.11E-04	0.00	1.09E-03	-8.98E-03		
Eutrophication, freshwater (EP-freshwater)	kg P eq	5.03E-05	1.97E-06	1.07E-05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.40E-06	0.00	5.71E-07	0.00E+00		
Eutrophication, marine water (EP-marine)	kg N eq	5.88E-03	3.77E-04	1.04E-03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.42E-04	0.00	9.58E-04	-1.69E-03		
Eutrophication, terrestrial (EP-terrestrial)	mol N eq	6.46E-02	4.16E-03	1.14E-02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.67E-03	0.00	2.34E-03	-1.85E-02		
Photochemical ozone formation (POCP)	kg NMVOC eq	1.86E-02	1.33E-03	3.84E-03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	8.18E-04	0.00	9.46E-04	-4.70E-03		
Depletion of abiotic resources - minerals and metals (ADP – minerals & metals) *	kg Sb eq	1.22E-05	6.61E-07	4.83E-06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.95E-07	0.00	2.29E-07	0.00E+00		
Depletion of abiotic resources - fossil fuels (ADP-fossil) *	MJ	2.36E+02	4.50E+00	2.84E+01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.02E+00	0.00	1.73E+00	-1.29E+02		
Water consumption (WDP) *	m3 depriv.	4.36E+00	1.55E-02	5.96E-02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	9.05E-03	0.00	8.37E-03	-1.73E-02		

* Disclaimer: The results of this Environmental Impact Indicator should be used with caution as the uncertainties of these results are high or experience with the indicator is limited.

* The additional environmental indicators of EN 15804:2012+A2:2019 are not declared in this EPD.

Indicator	Unit	Results per declared unit														
		Manufac turing	Construction		Use							End-of-life				Module
		A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Global Warming Potential GWP-GHG ³	kg CO2 eq	5.54E+00	2.86E-01	1.42E+00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.98E-01	0.00	9.14E-01	-1.08E+00

Use of resources

Indicator	Unit	Results per declared unit														
		Manufacturing	Construction		Use							End-of-life				Module
		A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Renewable primary energy use excluding renewable primary energy resources used as raw material	MJ	5.86E+00	5.72E-02	2.86E-01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.26E-02	0.00	8.77E-02	0.00E+00
Use of renewable primary energy used as raw material	MJ	0.00E+00	0.00E+00	0.00E+00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00E+00	0.00	0.00E+00	0.00E+00
Total use of renewable primary energy (primary energy and renewable primary energy resources used as raw material)	MJ	5.86E+00	5.72E-02	2.86E-01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.26E-02	0.00	8.77E-02	0.00E+00
Non-renewable primary energy use, excluding non-renewable primary energy resources used as raw materials	MJ	2.53E+02	4.78E+00	3.07E+01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.21E+00	0.00	1.84E+00	-1.37E+02
Use of non-renewable primary energy used as raw material	MJ	2.21E-01	0.00E+00	0.00E+00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00E+00	0.00	0.00E+00	0.00E+00
Total non-renewable primary energy use (primary energy and renewable primary energy resources used as raw material)	MJ	2.53E+02	4.78E+00	3.07E+01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.21E+00	0.00	1.84E+00	-1.37E+02
Use of secondary materials	kg	0.00E+00	0.00E+00	0.00E+00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00E+00	0.00	0.00E+00	0.00E+00
Use of renewable secondary fuels	MJ	0.00E+00	0.00E+00	0.00E+00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00E+00	0.00	0.00E+00	0.00E+00
Use of non-renewable secondary fuels	MJ	0.00E+00	0.00E+00	0.00E+00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00E+00	0.00	0.00E+00	0.00E+00

³ The indicator includes all greenhouse gases included in GWP-total but excludes the uptake and emissions of biogenic carbon dioxide and biogenic carbon stored in the product. Therefore, this indicator is almost equal to the GWP indicator originally defined in EN 15804:2012+A1:2013.

Indicator	Unit	Results per declared unit														
		Manufacturing	Construction		Use							End-of-life				Module
		A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Net use of freshwater resources	m³	9.69E-02	5.34E-04	1.93E-03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.37E-04	0.00	2.22E-03	-4.03E-04

Waste generation and outflows

Waste generation

Indicator	Unit	Results per declared unit														
		Manufacturing	Construction		Use							End-of-life				Module
			A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4
Hazardous waste disposed	kg	7.23E-05	1.09E-05	1.87E-05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	7.89E-06	0.00	2.08E-06	0.00E+00
Non-hazardous waste disposed	kg	8.57E-01	4.19E-01	7.17E-02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.55E-01	0.00	7.69E+00	0.00E+00
Radioactive waste disposed	kg	2.23E-04	3.05E-05	1.34E-05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.04E-05	0.00	1.13E-05	0.00E+00

Outflows

Indicator	Unit	Results per declared unit															
		Manufacturing	Construction			Use							End-of-life				Module
		A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D	
Components for reuse	kg	0.00E+00	0.00E+00	0.00E+00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00E+00	0.00	0.00E+00	0.00	
Recycling materials	kg	7.00E+00	0.00E+00	0.00E+00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00E+00	0.00	0.00E+00	0.00	
Materials for energy recovery (energy recovery)	kg	0.00E+00	0.00E+00	0.00E+00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00E+00	0.00	0.00E+00	0.00	
Energy exported electricity	MJ	0.00E+00	0.00E+00	0.00E+00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00E+00	0.00	0.00E+00	0.00	
Energy exported thermal	MJ	0.00E+00	0.00E+00	0.00E+00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00E+00	0.00	0.00E+00	0.00	

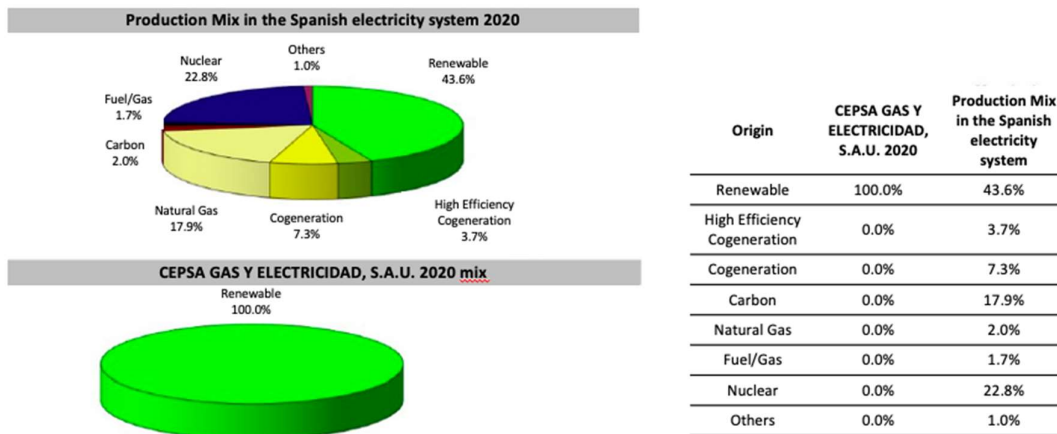
Biogenic carbon content information

Results per declared unit		
Biogenic carbon content information	Unit	Quantity
Biogenic carbon content in the product	kg C	0.00E+00
Biogenic carbon content in the enclosed packaging	kg C	5.52E-02

Note: 1 kg of biogenic carbon is equivalent to 44/12 kg CO₂.

Additional environmental information

The electricity mix used for the characterization of electricity has been a combination of 61% of renewable energies and 39% of the Spanish mix for the year 2020.



Information related to the sectorial EPD

This EPD® is not sector specific.

Differences with previous versions

This is the second version of this EPD.

The composition of the product was changed by modifying the bitumen content.

The previous energy mix has been updated to the Supplier's Electricity Mix for the year 2020.

The SimaPro calculation software version has been upgraded from v8.4.0 to v9.3.

The Ecoinvent v3.3 database version has been upgraded to v3.8.

The installation (A4 and A5) and end-of-life (C3 and C4) modules have been updated according to the EWA Sectorial EPD.

The energy consumption of the production line has been updated.

References

- General Instructions of the International EPD® System Program version 3.01.
- PCR 2019: 14 Construction products (EN 15804:A2) version 1.11.
- CEN (2019): UNE-EN 15804:2012+A2:2019 Sustainability of construction works - Environmental product.
- Declarations - Basic rules for the Construction product category.
- ISO 14020: 2000 Environmental labels and declarations - General principles.
- ISO 14025: 2010 Environmental labels and declarations - Environmental declarations Type III - Principles and procedures.
- ISO 14040: 2006 Environmental management - Life cycle assessment - Principles and framework.
- ISO 14044: 2006 Environmental management - Life cycle assessment - Requirements and guidelines.
- LCA DANOSA WATERPROOFING SYSTEMS 2023.

VERIFICATION STATEMENT CERTIFICATE CERTIFICADO DE DECLARACIÓN DE VERIFICACIÓN

Certificate No. / Certificado nº: EPD00412

TECNALIA R&I CERTIFICACION S.L., confirms that independent third-party verification has been conducted of the Environmental Product Declaration (EPD) on behalf of:

TECNALIA R&I CERTIFICACION S.L., confirma que se ha realizado verificación de tercera parte independiente de la Declaración Ambiental de Producto (DAP) en nombre de:

DERIVADOS ASFALTICOS NORMALIZADOS, S.A. (DANOSA)
Pol. Ind. Sector, 9
19290 - FONTANAR (Guadalajara) SPAIN

for the following product(s):
para el siguiente(s) producto(s):

WATERPROOFING SYSTEMS WITH BITUMINOUS MEMBRANE:
TPP1 / TPC1 / TPC2 / TVH1 / TVA1 / NTG1 / NTV1 / NTV2 / NTV5 / NTV6 / EXT1.
SISTEMAS DE IMPERMEABILIZACIÓN CON MEMBRANA BITUMINOSA:
TPP1 / TPC1 / TPC2 / TVH1 / TVA1 / NTG1 / NTV1 / NTV2 / NTV5 / NTV6 / EXT1.

with registration number **S-P-01493** in the International EPD® System (www.environdec.com).
con número de registro **S-P-01493** en el Sistema Internacional EPD® (www.environdec.com).

it's in conformity with:
es conforme con:

- **ISO 14025:2010 Environmental labels and declarations. Type III environmental declarations.**
- **General Programme Instructions for the International EPD® System v.3.01.**
- **PCR 2019:14 Construction products (EN 15804:A2) v.1.11.**
- **CPC 5453 Waterproofing and roofing services.**

Issued date / Fecha de emisión: 25/02/2019
Update date / Fecha de actualización: 31/03/2023
Valid until / Válido hasta: 28/03/2028
Serial Nº / Nº Serie: EPD0041201-E



Carlos Nazabal Alsua
Manager



This certificate is not valid without its related EPD.
Este certificado no es válido sin su correspondiente EPD.

El presente certificado está sujeto a modificaciones, suspensiones temporales y retiradas por TECNALIA R&I CERTIFICACION.
This certificate is subject to modifications, temporary suspensions and withdrawals by TECNALIA R&I CERTIFICACION.
El estado de vigencia del certificado puede confirmarse mediante consulta en www.tecnaliacertificacion.com.
The validity of this certificate can be checked through consultation in www.tecnaliacertificacion.com.

