

# Environmental Product Declaration

for Adhesives by ISOMAT

<p><b>Programme</b> The International EPD® System, www.environdec.com</p>	<p><b>Programme operator</b> EPD International AB</p>	<p><b>EPD registration number</b> S-P-06170</p>	<p><b>Publication date</b> 2022-07-20</p>	<p><b>Valid until</b> 2027-07-19</p>	<p><b>Geographical scope</b> Global</p>
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In accordance with ISO 14025  
and EN 15804:2012+A2:2019:

- ISOMAT AK-18
- ISOMAT AK-20
- ISOMAT AK-22
- ISOMAT AK-23 XXL
- ISOMAT AK-25
- ISOMAT AK-RAPID FLEX

EPD owner



ISOMAT

17th km Thessaloniki – Ag. Athanasios Road,  
P.O. BOX 1043, 570 03 Ag. Athanasios, Greece  
[export@isomat.eu](mailto:export@isomat.eu) | [www.isomat.eu](http://www.isomat.eu)

LCA consultant



ENVIROMETRICS ltd

Kodrou 3 str., 11636, Athens, Greece  
[info@envirometrics.gr](mailto:info@envirometrics.gr) | [www.envirometrics.gr](http://www.envirometrics.gr)

Programme operator

EPD International AB Box 210 60 SE-100 31  
Stockholm Sweden[www.environdec.com](http://www.environdec.com) | [info@environdec.com](mailto:info@environdec.com)

Third party verifier

Prof. Vladimír Kočí Šárecká 5,16000,  
Prague 6 - Czech Republic  
[www.lcastudio.cz](http://www.lcastudio.cz)

Accredited by

The International EPD® system

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

### Product category rules (PCR)

CEN standard EN 15804 serves as the Core Product Category Rules (PCR).

Product category rules (PCR): PCR 2019:14 Construction products, version 1.11. Published on 2021.02.05, valid until: 2024.12.20.

CPC CODE: 375 Articles of concrete, cement and plaster.

PCR review was conducted by the Technical Committee of the International EPD® System.

Chair: Contact via [info@environdec.com](mailto:info@environdec.com)**The EPD owner has the sole ownership, liability, and responsibility for the EPD.**

EPDs within the same product category but from different programmes may not be comparable.

EPDs of construction products may not be comparable if they do not comply with EN 15804.

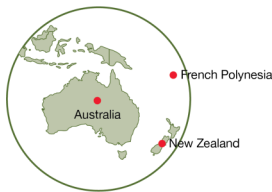
For further information about comparability, see EN 15804 and ISO 14025.

The verifier and the programme operator do not make any claim or have any responsibility of the legality of the product.



## Company Info

**ISOMAT** is a Greek multinational Group specializing in the development and manufacture of building chemicals, mortars and paints. For over 40 years, **ISOMAT** has been making a history of quality, reliability, advanced know-how and continuous business growth. It has three production plants; one in the parent company in Greece and two in its subsidiaries in Romania and Serbia. In addition, it has five sales subsidiaries in Germany, Russia, Turkey, Bulgaria, and Slovenia and exports to over 80 countries worldwide.



The **ISOMAT** Group produces and distributes an extensive range of high-quality products falling into the following 8 product categories:

- Waterproofing
- External Thermal Insulation
- Paints & Surface Protection
- Tile & Stone Installation
- Concrete Admixtures & Repair Products
- Masonry Construction & Repair
- Industrial Floorings
- Microcement Coatings & Decorative Floorings

**ISOMAT** is committed to continuously developing new, pioneering products in keeping pace with the ever-increasing market needs and technological advancements in the construction industry and with sustainability as its main drive. It owns a fully organized R&D department consisting of 7 chemistry R&D labs and 4 Quality Control labs staffed by highly qualified scientific personnel. Their mission is to continuously optimize existing products and develop innovative, high-performing product solutions and integrated systems covering a wide range of construction needs and applications.

## Energy and Social Responsibility Policy

For **ISOMAT**, its people are its key asset in which it constantly invests and thanks to which it evolves. The company's primary concern is to ensure safe and healthy working conditions, have an excellently trained staff, and provide continuous training through technical or educational seminars. In addition, it implements corporate social responsibility practices in relationships with socially vulnerable groups, public benefit foundations and entities, hospitals, educational institutions, public services, etc. Plus, with a customer-centric approach, ISOMAT meets its customers' ever-changing needs and provides a high-quality service experience.

**ISOMAT** operates in compliance with the requirements of the Legislation, the ISO 9001: 2015 standard and other international standards, based on which its products are certified. The efficiency of the Quality Management System is constantly being improved and measurable quality targets are established and reviewed on an annual basis. These objectives are stated in the annual quality review.

Sustainability is a strategic priority for the **ISOMAT** Group. **ISOMAT**'s Environmental and Energy Policy is oriented toward the guiding principles of sustainability and environmental protection. It implements an Energy and Environmental Management system, certified according to ISO 50001 and ISO 14001, to reduce the consumption of available natural resources and water, reduce the burden of the atmosphere, and save energy during the production process. Waste recycling is another priority for management and employees, as it is promoted through corporate policy as a whole. In this way, the Group's environmental footprint is reduced year by year. Last but not least, aiming towards sustainability, **ISOMAT** is continuously developing and producing more and more premium quality products that contribute to the creation of a healthy living environment and workspace. These products have been awarded internationally recognized certifications for both their technical characteristics and their friendliness towards applicators, end-users, and the environment.

P R E M I S E S



## Product Info

This is an average product EPD for multiple categories of ISOMAT adhesive mortars. Maximum GWP-GHG deviation of these products shall be 10%, thus they can be divided into four product categories, each one representing one weighted average product. The results of this EPD represent the weighted average product. The four different categories are presented below.

High-performance adhesives	High-performance, extra-flexible adhesives	High-performance, ultra-flexible adhesives	High-performance, fast-setting, flexible adhesives
ISOMAT AK-18 (grey and white)	ISOMAT AK-22 (grey and white)	ISOMAT AK-25 (grey and white)	ISOMAT AK-RAPID FLEX (grey and white)
ISOMAT AK-20 (grey and white)	ISOMAT AK-23 XXL (grey and white)		

### ISOMAT AK-18

ISOMAT AK-18 is a high-performance, cement-based tile adhesive, enhanced with resins, with no vertical slip and extended open time. Provides high initial and final adhesion strength and resistance to moisture. Certified according to EN 12004 and classified as C2 TE adhesive (CE marked).

ISOMAT AK-18 is suitable for fixing both absorbent and non-absorbent wall or floor tiles on a variety of substrates and especially where high adhesion and resistance to moisture are required. For indoor or outdoor use.

### ISOMAT AK-20

ISOMAT AK-20 is a high-performance, flexible, cement-based tile adhesive, enhanced with resins, with extended open time and no vertical slip. Provides high initial and final adhesion strength, moisture resistance and flexibility. Certified according to EN 12004 and classified as type C2 TE S1 adhesive (CE marked).

ISOMAT AK-20 is suitable for fixing all types of wall and floor tiles, including absorbent and non-absorbent tiles (e.g. grès porcellanato), natural stone, decorative bricks, large-format tiles, etc., on a variety of substrates, especially where high adhesion, flexibility and moisture resistance are required (e.g. old tile layers, heated floors, gypsum boards, etc.). For indoor and outdoor use.

### ISOMAT AK-22

ISOMAT AK-22 is a high-performance, extra-flexible, cement-based tile adhesive, enhanced with resins, with no vertical slip and extended open time. Provides high initial and final adhesion strength, extra flexibility and resistance to moisture. Certified according to EN 12004 and classified as a C2 TE S1 adhesive (CE marked).

ISOMAT AK-22 is suitable for fixing all types of walls and floors tiles, including absorbent and non-absorbent tiles (e.g. grès porcellanato), natural stone, decorative bricks, large-format tiles, etc. Well-suited for applications where extra flexibility, high adhesion and moisture resistance are required, such as existing ceramic tile layers, heated floors, metal surfaces, swimming pools, etc.). For indoor and outdoor use.

## **ISOMAT AK-23 XXL**

ISOMAT AK-23 XXL is a high-performance, quick-setting, extra-flexible, cement-based tile adhesive, enhanced with resins, with no vertical slip and extended open time. Provides high initial and final adhesion strength and resistance to moisture. Certified according to EN 12004 and classified as C2 TE S1 adhesive (CE marked).

ISOMAT AK-23 XXL is suitable for fixing all types of ceramic wall and floor tiles to a variety of substrates. Particularly well-suited for large-format tiles and natural stone tiles (marble, granite). Ideal where fast-track application, high adhesion, extra flexibility and moisture resistance are required (e.g. old tile layers, heated floors, etc.). For indoor and outdoor use.

## **ISOMAT AK-25**

ISOMAT AK-25 is a high-performance, ultra-flexible, cement-based tile adhesive, enhanced with resins, with extended open time and no vertical slip. Provides high initial and final adhesion strength and resistance to moisture. Certified according to EN 12004 and classified as C2 TE S2 adhesive (CE marked).

ISOMAT AK-25 is suitable for fixing all types of wall and floor tiles, including absorbent and non-absorbent tiles (e.g. grès porcellanato), natural stone, decorative bricks, large-format tiles, etc. Well-suited for applications where ultra flexibility, high adhesion and moisture resistance are required and for substrates subject to movement due to expansion/contraction or vibration, such as balconies, flat roofs, heated floors, metal surfaces, wood floors, old tile layers, swimming pools, gypsum boards, etc. For indoor and outdoor use.

## **ISOMAT AK-RAPID FLEX**

ISOMAT AK-RAPID FLEX is a high-performance, fast-setting, flexible, cement-based tile adhesive, enhanced with resins, with no vertical slip. Provides high initial and final adhesion strength, moisture resistance and flexibility. Thanks to its high crystalline water-binding capacity, it is ideal for fixing of stain-sensitive natural stone tiles, e.g. marble, granite, etc., since it prevents stain damage. Certified according to EN 12004 and classified as type C2 FT S1 adhesive (CE marked).

ISOMAT AK-RAPID FLEX is suitable for fixing absorbent or non-absorbent wall and floor tiles to a variety of surfaces, including concrete, brickwork, plaster, etc., especially where high adhesion, flexibility and moisture resistance are required. Ideal in cases where fast return-to-service is required, e.g. in renovation projects of shops, shopping centers, etc. Well-suited for fixing of stain-sensitive natural stone tiles, e.g. marble, granite, etc., as well as of large-format ceramic tiles to walls and floors. For indoor and outdoor use.

Technical Specifications						
Specification	ISOMAT AK-18	ISOMAT AK-20	ISOMAT AK-22	ISOMAT AK-23 XXL	ISOMAT AK-25	ISOMAT AK-RAPID FLEX
<b>Form</b>	Cementitious powder	Cementitious powder	Cementitious powder	Cementitious powder	Cementitious powder	Cementitious powder
<b>Colors</b>	Grey, white	Grey, white	Grey, white	Grey, white	Grey, white	Grey, white
<b>Water demand</b>	7,25 - 7,75 l /25 kg bag	7,50 - 8,00 l /25 kg bag	7,50 - 8,00 l /25 kg bag	7,00 - 7,50 l /25 kg bag	7,25 - 7,75 l /25 kg bag	6,75 - 7,25 l /25 kg bag
<b>Application temperature</b>	from +5°C to +35°C	from +5°C to +35°C	from +5°C to +35°C	from +5°C to +35°C	from +5°C to +35°C	from +5°C to +35°C
<b>Application thickness</b>	up to 10 mm	up to 15 mm	up to 15 mm	up to 15 mm	up to 15 mm	up to 10 mm
<b>Pot life</b>	at least 6 h	at least 6 h	at least 6 h	at least 2 - 3 h	at least 6 h	at least 60 min
<b>Open time</b>	at least 30 min	at least 30 min	at least 30 min	at least 30 min	at least 30 min	at least 10 min
<b>Minor adjustments open time</b>	at least 30 min	at least 30 min	at least 30 min	at least 30 min	at least 30 min	at least 15 min
<b>Slip</b>	≤ 0,5 mm	≤ 0,5 mm	≤ 0,5 mm	≤ 0,5 mm	≤ 0,5 mm	≤ 0,5 mm
<b>Wall grouting</b>	after 3 - 8 h	after 3 - 8 h	after 3 - 8 h	after 3 - 8 h	after 4 - 8 h	after 1 - 2 h
<b>Floor grouting</b>	after 24 h	after 24 h	after 24 h	after 8 -10 h	after 24 h	after 2 - 3 h
<b>Adhesion strength after:</b>						
<b>28 days</b>	≥ 1,40 N/mm <sup>2</sup>	≥ 1,75 N/mm <sup>2</sup>	≥ 1,90 N/mm <sup>2</sup>	≥ 2,00 N/mm <sup>2</sup>	≥ 2,00 N/mm <sup>2</sup>	≥ 1,80 N/mm <sup>2</sup>
<b>heating at +70°C</b>	≥ 1,00 N/mm <sup>2</sup>	≥ 1,50 N/mm <sup>2</sup>	≥ 1,90 N/mm <sup>2</sup>	≥ 2,00 N/mm <sup>2</sup>	≥ 2,00 N/mm <sup>2</sup>	≥ 2,00 N/mm <sup>2</sup>
<b>immersion in water</b>	≥ 1,00 N/mm <sup>2</sup>	≥ 1,30 N/mm <sup>2</sup>	≥ 1,50 N/mm <sup>2</sup>	≥ 1,30 N/mm <sup>2</sup>	≥ 1,20 N/mm <sup>2</sup>	≥ 1,20 N/mm <sup>2</sup>
<b>25 freeze-thaw cycles</b>	≥ 1,00 N/mm <sup>2</sup>	≥ 1,50 N/mm <sup>2</sup>	≥ 1,50 N/mm <sup>2</sup>	≥ 1,40 N/mm <sup>2</sup>	≥ 1,20 N/mm <sup>2</sup>	≥ 1,30 N/mm <sup>2</sup>
<b>Deformability</b>	—	> 2,5 mm	> 2,5 mm	> 2,5 mm	> 5,0 mm	> 2,5 mm
Composition						
The composition ranges presented below cover all the different types of adhesives.						
<b>Cement</b>	20-40%					
<b>Calcium carbonate filler</b>	50-70%					
<b>Vinyl acetate ethylene</b>	< 10%					
<b>Metakaolin</b>	< 5%					
<b>Calcium formate</b>	< 5%					
<b>Calcium sulfate anhydrite</b>	< 5%					
No substance in the "Candidate List of Substances of Very High Concern (SVHC) for authorization" exceeds 0.1% by weight in the final products.						



## System Boundaries

X= Included, MND= Module Not Declared																	
	Product stage			Construction stage		Use stage							End-of-life stage				Resource recovery stage
	Raw Materials Supply	Transport	Manufacturing	Transport	Construction installation	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction and demolition	Transport	Waste processing for re-use, recovery and/or recycling	Disposal	Re-use-Recovery-Recycling-potential
Module	A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Modules declared	X	X	X	MND	MND	MND	MND	MND	MND	MND	MND	MND	X	X	X	X	X
Geography	EU	EU	GR										EU	EU	EU	EU	EU
Specific data used	> 90%			—	—	—	—	—	—	—	—	—	—	—	—	—	—
Variation-products	< 10%			—	—	—	—	—	—	—	—	—	—	—	—	—	—
Variation-sites	Not relevant			—	—	—	—	—	—	—	—	—	—	—	—	—	—

### A1: Raw Material Supply

The production starts with the material supply. This stage includes the extraction and processing of raw materials, the generation of electricity and fuels required for the manufacturing stage. Portland cement and calcium carbonate are the main raw materials.

### A2: Transportation of raw materials to manufacturer

Transport is relevant for delivery of raw materials from the supplier to the gate of manufacturing plant. Raw materials for the production are transported by trucks from different regions all over the world.



### A3: Manufacturing

Manufacturing starts with weighing of raw materials. After weighing, raw materials are mixed and transferred to specially formed silos in order to obtain their final structure. Last stage of manufacturing is the packaging of final products.

### C1: De-construction, demolition

Demolition of adhesive mortars takes place with the whole demolition of the building/construction. Thus, it is assumed that energy used for the demolition of adhesives has minor significance and the environmental impact of this module is set to be zero.

### C2: Transportation of waste

A distance of 100 km by a 16-32 tonne lorry from construction/demolition sites to disposal sites has been chosen as a conservative assumption.

### C3: Waste processing for re-use, recovery and/or recycling

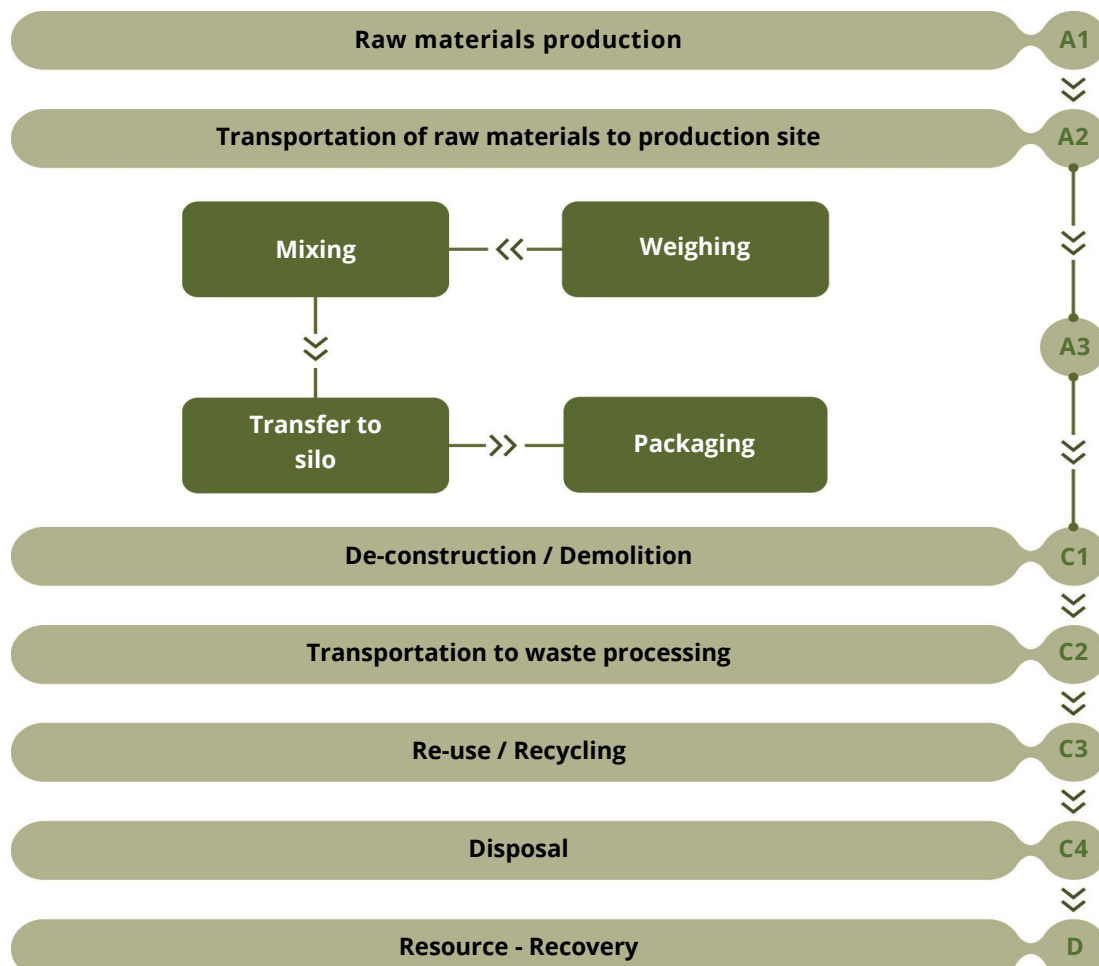
This module includes waste processing of the product after its life cycle in order to be recycled and reused in another product system. It is assumed that 100% of adhesives' end-of-life waste will be landfilled, thus the environmental impact of this module is set to be zero.

### C4: Disposal

This module includes the final disposal of the discarded product. As mentioned above, 100% of adhesives' end-of-life waste will be landfilled.

### D: Resource-Recovery stage

Since the product is only disposed of, there are no benefits deriving from the re-use or recycling of the product after its end-of-life stage, and neither is any energy recovery from incinerating the packaging materials.



## LCA Info

**Declared unit:**

The declared unit is 1 kg of ISOMAT adhesive mortars.

**Goal and Scope:**

This EPD evaluates the environmental impacts of the production of 1 kg of ISOMAT adhesive mortars from Cradle to gate (A1-A3) with module C1-C4 and D.

**System Boundary:**

The system boundaries are set to be cradle to gate (A1-A3) with modules C+D.

**Cut-off rules:**

The cut-off criteria adopted are as stated in "EN 15804:2012+A2:2019". Where there is insufficient data for a unit process, the cut-off criteria are 1% of the total mass of input of that process. The total of neglected input flows per module is a maximum of 5% of energy usage and mass.

**Allocations:**

Allocation rules have been performed in accordance with the requirements of ISO 14044:2006. Wherever possible allocation was avoided. Allocation based on physical properties (mass) is applied where allocation cannot be avoided. In this case, allocation based on the mass of the final products is applied for electricity used in the plant. Electricity data from ISOMAT was collected separately for each facility (offices, warehouses, utilities, mortars production line and liquids production line) and then was allocated to the corresponding products by mass.

**Assumptions:**

**Modules A2 and C2:** A EURO4 16-32 tonne lorry was utilized for road transportation and a bulk carrier for dry goods for sea transportation.

**Module C1:** Demolition of adhesive mortars takes place with the whole demolition of the building/construction. Thus it is assumed that energy used for the demolition of adhesive mortars has minor significance and the environmental impact of this module is set to be zero.

**Module C2:** A conservative assumption of 100 km by a 16-32 tonne lorry was used.

**Module C3:** It is assumed that 100% of adhesive mortars' end-of-life waste will be landfilled, thus the environmental impact of this module is set to be zero.

**Module C4:** As mentioned above, 100% of adhesive mortars' end-of-life waste will be landfilled.

**Data quality:**

ISO 14044 was applied in terms of data collection and quality requirements. The impact of the production of raw materials recovered from Ecoinvent database v.3.8. The data concerning the modules A2 (Transportation) and A3 (Product manufacturing) were provided by ISOMAT and concerns the full year 2021. These data were the quantities of all input and output materials extracted from the company's SAP system, the consumed utilities (energy, water) and the distances and means of transport for each input stream. Regarding electricity mix, the latest (2020) national residual electricity mix as published in DAPEEP SA was utilized. The end-of-life is based on the most representative scenarios for this product. Background data for this stage are retrieved from Ecoinvent v.3.8.

**Geographical Scope:**

Worldwide

**Time representativeness:**

Data obtained refer to the year 2021

**Software used:**

OpenLCA v.1.10.3

## Environmental Performance

### High-performance adhesives

ENVIRONMENTAL IMPACTS	Unit	A1-A3	C1	C2	C3	C4	D
<b>GWP-total</b>	kg CO <sub>2</sub> eq	5,47E-01	0,00E+00	1,65E-02	0,00E+00	1,25E-02	0,00E+00
<b>GWP-fossil</b>	kg CO <sub>2</sub> eq	5,46E-01	0,00E+00	1,65E-02	0,00E+00	1,24E-02	0,00E+00
<b>GWP-biogenic</b>	kg CO <sub>2</sub> eq	6,39E-04	0,00E+00	5,55E-06	0,00E+00	5,05E-06	0,00E+00
<b>GWP-luluc</b>	kg CO <sub>2</sub> eq	2,65E-04	0,00E+00	5,58E-06	0,00E+00	2,60E-05	0,00E+00
<b>GWP-GHG<sup>1</sup></b>	kg CO <sub>2</sub> eq	5,34E-01	0,00E+00	1,63E-02	0,00E+00	1,23E-02	0,00E+00
<b>ODP</b>	kg CFC-11 eq	3,99E-08	0,00E+00	3,77E-09	0,00E+00	3,60E-09	0,00E+00
<b>AP</b>	mol H+ eq	2,11E-03	0,00E+00	8,25E-05	0,00E+00	1,11E-04	0,00E+00
<b>EP-freshwater</b>	kg PO <sub>4</sub> -3 eq	3,37E-04	0,00E+00	3,42E-06	0,00E+00	2,86E-06	0,00E+00
<b>EP-freshwater<sup>2</sup></b>	kg P eq	1,10E-04	0,00E+00	1,11E-06	0,00E+00	9,34E-07	0,00E+00
<b>EP-marine</b>	kg N eq	4,33E-04	0,00E+00	2,88E-05	0,00E+00	4,28E-05	0,00E+00
<b>EP-terrestrial</b>	mol N eq	4,80E-03	0,00E+00	3,14E-04	0,00E+00	4,68E-04	0,00E+00
<b>POCP</b>	kg NMVOC eq	1,50E-03	0,00E+00	8,95E-05	0,00E+00	1,32E-04	0,00E+00
<b>ADPe</b>	kg Sb eq	9,17E-06	0,00E+00	5,98E-08	0,00E+00	2,53E-08	0,00E+00
<b>ADPf</b>	MJ	5,81E+00	0,00E+00	2,51E-01	0,00E+00	2,48E-01	0,00E+00
<b>WDP<sup>3</sup></b>	m <sup>3</sup> eq	1,53E-01	0,00E+00	1,17E-03	0,00E+00	7,22E-03	0,00E+00

<sup>1</sup> GWP-GHG indicator includes all greenhouse gases included in GWP-total but excludes biogenic carbon dioxide emissions and uptake and biogenic carbon stored in the product, with characterization factors (CFs) based on IPCC (2013).

<sup>2</sup> Eutrophication aquatic freshwater shall be given in both kg PO<sub>4</sub> eq and kg P eq.

<sup>3</sup> The results of this environmental impact indicators of ADPf, ADPe and WDP shall be used with care as the uncertainties of these results are high or as there is limited experience with the indicator.

RESOURCE USE	Unit	A1-A3	C1	C2	C3	C4	D
PERE	MJ	4,33E-01	0,00E+00	3,38E-03	0,00E+00	2,56E-03	0,00E+00
PERM	MJ	7,43E-03	0,00E+00	0,00E+00	0,00E+00	4,00E+00	0,00E+00
PERT	MJ	4,40E-01	0,00E+00	3,38E-03	0,00E+00	4,00E+00	0,00E+00
PENRE	MJ	5,81E+00	0,00E+00	2,51E-01	0,00E+00	2,48E-01	0,00E+00
PENRM	MJ	7,43E-03	0,00E+00	0,00E+00	0,00E+00	4,00E+00	0,00E+00
PENRT	MJ	5,81E+00	0,00E+00	2,51E-01	0,00E+00	4,25E+00	0,00E+00
SM	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
RSF	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
NRSF	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
FW	m <sup>3</sup>	3,56E-03	0,00E+00	2,71E-05	0,00E+00	1,68E-04	0,00E+00

OUTPUT FLOWS AND WASTE CATEGORIES	Unit	A1-A3	C1	C2	C3	C4	D
HWD	kg	7,30E-06	0,00E+00	6,54E-07	0,00E+00	4,94E-07	0,00E+00
NHWD	kg	4,03E-02	0,00E+00	1,20E-02	0,00E+00	1,00E+00	0,00E+00
RWD	kg	1,53E-05	0,00E+00	1,72E-06	0,00E+00	1,64E-06	0,00E+00
CRU	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
MFR	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
MER	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
EE	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00



## High-performance, extra-flexible adhesives

ENVIRONMENTAL IMPACTS	Unit	A1-A3	C1	C2	C3	C4	D
<b>GWP-total</b>	kg CO <sub>2</sub> eq	5,82E-01	0,00E+00	1,65E-02	0,00E+00	1,25E-02	0,00E+00
<b>GWP-fossil</b>	kg CO <sub>2</sub> eq	5,81E-01	0,00E+00	1,65E-02	0,00E+00	1,24E-02	0,00E+00
<b>GWP-biogenic</b>	kg CO <sub>2</sub> eq	5,41E-04	0,00E+00	5,55E-06	0,00E+00	5,05E-06	0,00E+00
<b>GWP-luluc</b>	kg CO <sub>2</sub> eq	2,03E-04	0,00E+00	5,58E-06	0,00E+00	2,60E-05	0,00E+00
<b>GWP-GHG<sup>1</sup></b>	kg CO <sub>2</sub> eq	5,68E-01	0,00E+00	1,63E-02	0,00E+00	1,23E-02	0,00E+00
<b>ODP</b>	kg CFC-11 eq	3,89E-08	0,00E+00	3,77E-09	0,00E+00	3,60E-09	0,00E+00
<b>AP</b>	mol H <sup>+</sup> eq	2,15E-03	0,00E+00	8,25E-05	0,00E+00	1,11E-04	0,00E+00
<b>EP-freshwater</b>	kg PO <sub>4</sub> -3 eq	3,31E-04	0,00E+00	3,42E-06	0,00E+00	2,86E-06	0,00E+00
<b>EP-freshwater<sup>2</sup></b>	kg P eq	1,08E-04	0,00E+00	1,11E-06	0,00E+00	9,34E-07	0,00E+00
<b>EP-marine</b>	kg N eq	4,43E-04	0,00E+00	2,88E-05	0,00E+00	4,28E-05	0,00E+00
<b>EP-terrestrial</b>	mol N eq	4,91E-03	0,00E+00	3,14E-04	0,00E+00	4,68E-04	0,00E+00
<b>POCP</b>	kg NMVOC eq	1,54E-03	0,00E+00	8,95E-05	0,00E+00	1,32E-04	0,00E+00
<b>ADPe</b>	kg Sb eq	8,79E-06	0,00E+00	5,98E-08	0,00E+00	2,53E-08	0,00E+00
<b>ADPf</b>	MJ	6,42E+00	0,00E+00	2,51E-01	0,00E+00	2,48E-01	0,00E+00
<b>WDP<sup>3</sup></b>	m <sup>3</sup> eq	1,66E-01	0,00E+00	1,17E-03	0,00E+00	7,22E-03	0,00E+00

<sup>1</sup> GWP-GHG indicator includes all greenhouse gases included in GWP-total but excludes biogenic carbon dioxide emissions and uptake and biogenic carbon stored in the product, with characterization factors (CFs) based on IPCC (2013).

<sup>2</sup> Eutrophication aquatic freshwater shall be given in both kg PO<sub>4</sub> eq and kg P eq.

<sup>3</sup> The results of this environmental impact indicators of ADPf, ADPe and WDP shall be used with care as the uncertainties of these results are high or as there is limited experience with the indicator.

RESOURCE USE	Unit	A1-A3	C1	C2	C3	C4	D
PERE	MJ	3,25E-01	0,00E+00	3,38E-03	0,00E+00	2,56E-03	0,00E+00
PERM	MJ	1,09E-03	0,00E+00	0,00E+00	0,00E+00	4,00E+00	0,00E+00
PERT	MJ	3,26E-01	0,00E+00	3,38E-03	0,00E+00	4,00E+00	0,00E+00
PENRE	MJ	6,42E+00	0,00E+00	2,51E-01	0,00E+00	2,48E-01	0,00E+00
PENRM	MJ	1,09E-03	0,00E+00	0,00E+00	0,00E+00	4,00E+00	0,00E+00
PENRT	MJ	6,42E+00	0,00E+00	2,51E-01	0,00E+00	4,25E+00	0,00E+00
SM	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
RSF	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
NRSF	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
FW	m <sup>3</sup>	3,86E-03	0,00E+00	2,71E-05	0,00E+00	1,68E-04	0,00E+00

OUTPUT FLOWS AND WASTE CATEGORIES	Unit	A1-A3	C1	C2	C3	C4	D
HWD	kg	6,67E-06	0,00E+00	6,54E-07	0,00E+00	4,94E-07	0,00E+00
NHWD	kg	3,68E-02	0,00E+00	1,20E-02	0,00E+00	1,00E+00	0,00E+00
RWD	kg	1,55E-05	0,00E+00	1,72E-06	0,00E+00	1,64E-06	0,00E+00
CRU	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
MFR	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
MER	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
EE	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00

## High-performance, ultra-flexible adhesives

ENVIRONMENTAL IMPACTS	Unit	A1-A3	C1	C2	C3	C4	D
<b>GWP-total</b>	kg CO <sub>2</sub> eq	6,52E-01	0,00E+00	1,65E-02	0,00E+00	1,25E-02	0,00E+00
<b>GWP-fossil</b>	kg CO <sub>2</sub> eq	6,51E-01	0,00E+00	1,65E-02	0,00E+00	1,24E-02	0,00E+00
<b>GWP-biogenic</b>	kg CO <sub>2</sub> eq	8,61E-04	0,00E+00	5,55E-06	0,00E+00	5,05E-06	0,00E+00
<b>GWP-luluc</b>	kg CO <sub>2</sub> eq	3,26E-04	0,00E+00	5,58E-06	0,00E+00	2,60E-05	0,00E+00
<b>GWP-GHG<sup>1</sup></b>	kg CO <sub>2</sub> eq	6,33E-01	0,00E+00	1,63E-02	0,00E+00	1,23E-02	0,00E+00
<b>ODP</b>	kg CFC-11 eq	4,90E-08	0,00E+00	3,77E-09	0,00E+00	3,60E-09	0,00E+00
<b>AP</b>	mol H <sup>+</sup> eq	2,57E-03	0,00E+00	8,25E-05	0,00E+00	1,11E-04	0,00E+00
<b>EP-freshwater</b>	kg PO <sub>4</sub> -3 eq	3,87E-04	0,00E+00	3,42E-06	0,00E+00	2,86E-06	0,00E+00
<b>EP-freshwater<sup>2</sup></b>	kg P eq	1,26E-04	0,00E+00	1,11E-06	0,00E+00	9,34E-07	0,00E+00
<b>EP-marine</b>	kg N eq	5,32E-04	0,00E+00	2,88E-05	0,00E+00	4,28E-05	0,00E+00
<b>EP-terrestrial</b>	mol N eq	5,83E-03	0,00E+00	3,14E-04	0,00E+00	4,68E-04	0,00E+00
<b>POCP</b>	kg NMVOC eq	1,94E-03	0,00E+00	8,95E-05	0,00E+00	1,32E-04	0,00E+00
<b>ADPe</b>	kg Sb eq	1,01E-05	0,00E+00	5,98E-08	0,00E+00	2,53E-08	0,00E+00
<b>ADPf</b>	MJ	1,02E+01	0,00E+00	2,51E-01	0,00E+00	2,48E-01	0,00E+00
<b>WDP<sup>3</sup></b>	m <sup>3</sup> eq	2,47E-01	0,00E+00	1,17E-03	0,00E+00	7,22E-03	0,00E+00

<sup>1</sup> GWP-GHG indicator includes all greenhouse gases included in GWP-total but excludes biogenic carbon dioxide emissions and uptake and biogenic carbon stored in the product, with characterization factors (CFs) based on IPCC (2013).

<sup>2</sup> Eutrophication aquatic freshwater shall be given in both kg PO<sub>4</sub> eq and kg P eq.

<sup>3</sup> The results of this environmental impact indicators of ADPf, ADPe and WDP shall be used with care as the uncertainties of these results are high or as there is limited experience with the indicator.

RESOURCE USE	Unit	A1-A3	C1	C2	C3	C4	D
PERE	MJ	5,03E-01	0,00E+00	3,38E-03	0,00E+00	2,56E-03	0,00E+00
PERM	MJ	7,35E-03	0,00E+00	0,00E+00	0,00E+00	4,00E+00	0,00E+00
PERT	MJ	5,11E-01	0,00E+00	3,38E-03	0,00E+00	4,00E+00	0,00E+00
PENRE	MJ	1,02E+01	0,00E+00	2,51E-01	0,00E+00	2,48E-01	0,00E+00
PENRM	MJ	7,35E-03	0,00E+00	0,00E+00	0,00E+00	4,00E+00	0,00E+00
PENRT	MJ	1,02E+01	0,00E+00	2,51E-01	0,00E+00	4,25E+00	0,00E+00
SM	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
RSF	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
NRSF	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
FW	m <sup>3</sup>	5,74E-03	0,00E+00	2,71E-05	0,00E+00	1,68E-04	0,00E+00

OUTPUT FLOWS AND WASTE CATEGORIES	Unit	A1-A3	C1	C2	C3	C4	D
HWD	kg	8,86E-06	0,00E+00	6,54E-07	0,00E+00	4,94E-07	0,00E+00
NHWD	kg	6,24E-02	0,00E+00	1,20E-02	0,00E+00	1,00E+00	0,00E+00
RWD	kg	2,01E-05	0,00E+00	1,72E-06	0,00E+00	1,64E-06	0,00E+00
CRU	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
MFR	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
MER	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
EE	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00



## High-performance, fast-setting, flexible adhesives

ENVIRONMENTAL IMPACTS	Unit	A1-A3	C1	C2	C3	C4	D
<b>GWP-total</b>	kg CO <sub>2</sub> eq	6,32E-01	0,00E+00	1,65E-02	0,00E+00	1,25E-02	0,00E+00
<b>GWP-fossil</b>	kg CO <sub>2</sub> eq	6,31E-01	0,00E+00	1,65E-02	0,00E+00	1,24E-02	0,00E+00
<b>GWP-biogenic</b>	kg CO <sub>2</sub> eq	7,17E-04	0,00E+00	5,55E-06	0,00E+00	5,05E-06	0,00E+00
<b>GWP-luluc</b>	kg CO <sub>2</sub> eq	2,95E-04	0,00E+00	5,58E-06	0,00E+00	2,60E-05	0,00E+00
<b>GWP-GHG<sup>1</sup></b>	kg CO <sub>2</sub> eq	6,18E-01	0,00E+00	1,63E-02	0,00E+00	1,23E-02	0,00E+00
<b>ODP</b>	kg CFC-11 eq	4,81E-08	0,00E+00	3,77E-09	0,00E+00	3,60E-09	0,00E+00
<b>AP</b>	mol H <sup>+</sup> eq	2,38E-03	0,00E+00	8,25E-05	0,00E+00	1,11E-04	0,00E+00
<b>EP-freshwater</b>	kg PO <sub>4</sub> -3 eq	3,53E-04	0,00E+00	3,42E-06	0,00E+00	2,86E-06	0,00E+00
<b>EP-freshwater<sup>2</sup></b>	kg P eq	1,15E-04	0,00E+00	1,11E-06	0,00E+00	9,34E-07	0,00E+00
<b>EP-marine</b>	kg N eq	5,23E-04	0,00E+00	2,88E-05	0,00E+00	4,28E-05	0,00E+00
<b>EP-terrestrial</b>	mol N eq	5,77E-03	0,00E+00	3,14E-04	0,00E+00	4,68E-04	0,00E+00
<b>POCP</b>	kg NMVOC eq	1,80E-03	0,00E+00	8,95E-05	0,00E+00	1,32E-04	0,00E+00
<b>ADPe</b>	kg Sb eq	8,73E-06	0,00E+00	5,98E-08	0,00E+00	2,53E-08	0,00E+00
<b>ADPf</b>	MJ	7,56E+00	0,00E+00	2,51E-01	0,00E+00	2,48E-01	0,00E+00
<b>WDP<sup>3</sup></b>	m <sup>3</sup> eq	1,81E-01	0,00E+00	1,17E-03	0,00E+00	7,22E-03	0,00E+00

<sup>1</sup> GWP-GHG indicator includes all greenhouse gases included in GWP-total but excludes biogenic carbon dioxide emissions and uptake and biogenic carbon stored in the product, with characterization factors (CFs) based on IPCC (2013).

<sup>2</sup> Eutrophication aquatic freshwater shall be given in both kg PO<sub>4</sub> eq and kg P eq.

<sup>3</sup> The results of this environmental impact indicators of ADPf, ADPe and WDP shall be used with care as the uncertainties of these results are high or as there is limited experience with the indicator.

RESOURCE USE	Unit	A1-A3	C1	C2	C3	C4	D
PERE	MJ	4,58E-01	0,00E+00	3,38E-03	0,00E+00	2,56E-03	0,00E+00
PERM	MJ	7,76E-03	0,00E+00	0,00E+00	0,00E+00	4,00E+00	0,00E+00
PERT	MJ	4,66E-01	0,00E+00	3,38E-03	0,00E+00	4,00E+00	0,00E+00
PENRE	MJ	7,56E+00	0,00E+00	2,51E-01	0,00E+00	2,48E-01	0,00E+00
PENRM	MJ	7,76E-03	0,00E+00	0,00E+00	0,00E+00	4,00E+00	0,00E+00
PENRT	MJ	7,57E+00	0,00E+00	2,51E-01	0,00E+00	4,25E+00	0,00E+00
SM	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
RSF	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
NRSF	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
FW	m <sup>3</sup>	4,22E-03	0,00E+00	2,71E-05	0,00E+00	1,68E-04	0,00E+00

OUTPUT FLOWS AND WASTE CATEGORIES	Unit	A1-A3	C1	C2	C3	C4	D
HWD	kg	8,50E-06	0,00E+00	6,54E-07	0,00E+00	4,94E-07	0,00E+00
NHWD	kg	6,72E-02	0,00E+00	1,20E-02	0,00E+00	1,00E+00	0,00E+00
RWD	kg	2,01E-05	0,00E+00	1,72E-06	0,00E+00	1,64E-06	0,00E+00
CRU	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
MFR	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
MER	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
EE	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00

## Additional Info

The EPD does not give information on release of dangerous substances to soil, water and indoor air because the horizontal standards on measurement of release of regulated dangerous substances from construction products using harmonized test methods according to the provisions of the respective technical committees for European product standards are not available.

## Abbreviations

<b>LCA</b>	Life Cycle assessment
<b>EPD</b>	Environmental Product Declaration
<b>PCR</b>	Product category rules
<b>GLO</b>	Global
<b>RER</b>	Europe
<b>RoW</b>	Rest of the world
<b>GWP-total</b>	Global Warming Potential total
<b>GWP-fossil</b>	Global Warming Potential fossil
<b>GWP-biogenic</b>	Global Warming Potential biogenic
<b>GWP-luluc</b>	Global Warming Potential land use and land use change
<b>ODP</b>	Ozone Depletion Potential
<b>AP</b>	Acidification Potential
<b>EP-freshwater</b>	Eutrophication potential, fraction of nutrients reaching freshwater end compartment
<b>EP-marine</b>	Eutrophication Potential fraction of nutrients reaching marine end compartment
<b>EP-terrestrial</b>	Eutrophication potential, Accumulated Exceedance
<b>POCP</b>	Formation potential of tropospheric ozone photochemical oxidants
<b>ADPe</b>	Abiotic depletion potential for non-fossil resources
<b>ADPf</b>	Abiotic depletion potential for fossil resources
<b>WDP</b>	Water use
<b>PERE</b>	Use of renewable primary energy excluding resources used as raw materials
<b>PERM</b>	Use of renewable primary energy resources used as raw materials
<b>PERT</b>	Total use of renewable primary energy resources
<b>PENRE</b>	Use of non-renewable primary energy excluding resources used as raw materials
<b>PENRM</b>	Use of non-renewable primary energy resources used as raw materials
<b>PENRT</b>	Total use of non-renewable primary energy resources

<b>SM</b>	Use of secondary material
<b>RSF</b>	Use of renewable secondary fuels
<b>NRSF</b>	Use of non-renewable secondary fuels
<b>FW</b>	Use of net fresh water
<b>HWD</b>	Hazardous waste disposed
<b>NHWD</b>	Non-hazardous waste disposed
<b>RWD</b>	Radioactive waste disposed
<b>CRU</b>	Components for re-use
<b>MFR</b>	Materials for recycling
<b>MER</b>	Materials for energy recovery
<b>EE</b>	Exported Energy

## References

**General Programme Instructions** of the International EPD® System. Version 3.01, 2019-09-18

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**ISO 14040:2006** Environmental management — Life cycle assessment — Principles and framework

**ISO 14044:2006** Environmental management — Life cycle assessment — Requirements and guidelines

**Ecoinvent / Ecoinvent Centre**, [www.Eco-invent.org](http://www.Eco-invent.org)

**Residual Energy Mix 2020** from Renewable Energy Sources Operator & Guarantees of Origin (DAPEEP SA)