

DAPHabitat System Environmental Product Declaration

www.daphabitat.pt

[according to ISO 14025, EN 15804:2012+A2:2019 and EN 15942]



Declaration number: DAP 002:2023



Products SIBExtreme

Issue date: 18/10/2023

Valid until: 17/10/2028

SIB - SOCIEDADE INDUSTRIAL DE BRITAGEM DE PEDRA, LDA.



Versão 1.4. September 2023 Edition

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1. GENERAL INFORMATION

1.1. The DAPHabitat System

Program operator:	Sustainable Construction Platform www.centrohabitat.net centrohabitat@centrohabitat.net	 centroHabitat Plataforma para a Construção Sustentável
Address:	Departamento Engenharia Civil Universidade de Aveiro 3810-193 Aveiro	
Email address:	deptechnico@centrohabitat.net	
Telephone number:	(+351) 234 401576	
Website:	www.daphabitat.pt	
Logo:		



1.2. EPD owner

Name of the owner:	SIB – Sociedade Industrial de Britagem de Pedra, Lda.	
Production site:	Rua São Luis Gonzaga, n.º 50, Padrão 2410-199, Leiria, Portugal	
Address (head office):	Rua São Luis Gonzaga, n.º 50, Padrão 2410-199, Leiria, Portugal	
Telephone:	+351 244 744 431	
E-mail:	geral@sibland.pt	
Website:	www.sibland.company	
Logo:		
Information concerning the applicable management Systems:	  ISO 9001:2015 – Quality Management System	
Specific aspects regarding the production:	CAE Principal: 23640-R3	
Organization's environmental policy:	SIBLAND carries out sustainable product development with respect for the environment and without adversely affecting the expectations of future generations.	


1.3. Information concerning the EPD

Authors:	1. Technological Center of Ceramics and Glass 2. SIB – Sociedade Industrial de Britagem de Pedra, Lda.
Contact of the authors:	1. CTCV materials: habitat iParque – Parque Tecnológico de Coimbra - Lote 6 3040-540 Antanhol – Portugal (T) +351 239 499 200 Marisa Almeida: marisa@ctcv.pt 2. SIBLAND – Sociedade Industrial de Britagem de Pedra Lda. Rua São Luis Gonzaga, n.º 50, Padrão 2410-199, Leiria, Portugal (T) +351 244 744 431
Issue date:	2023-10-18
Registration date:	2023-11-03
Registration number:	DAP 002:2023
Valid until:	2028-10-17
Representativity of the EPD (location, manufacturer, group of manufacturers):	EPD of a decorative mortar for floors, produced in one production unit, belonging to a single producer (SIB – Sociedade Industrial de Britagem de Pedra Lda.)
Where to consult explanatory material:	https://sibland.company/
Type of EPD:	EPD from cradle-to-gate with the distribution option (A1-A3, A4)

1.4. Demonstration of the verification

External independent verification, accordingly with the standard ISO 14025:2010 and EN 15804:2012+A2:2019	
Certification Body	Verifier(s)
	
(CERTIF – Associação para a Certificação)	(Helena Gervásio)

1.5. EPD Registration

Programme Operator

(Plataforma para a Construção Sustentável)

1.6. PCR (product category rules) basic model


Name:	PCR: Basic module for construction products and services
Issue date:	19/01/2016
Number of registration on the data base:	RCP-mb001
Version:	Version 2.3 (August 2023)
Identification and contact of the coordinator (s):	Marisa Almeida marisa@ctcv.pt Luís Arroja arroja@ua.pt José Dinis Silvestre jose.silvestre@ist.utl.pt
Identification and contact of the authors:	Marisa Almeida marisa@ctcv.pt Luís Arroja arroja@ua.pt José Silvestre jds@civil.ist.utl.pt Fausto Freire Cristina Rocha Ana Paula Duarte Ana Cláudia Dias Helena Gervásio Victor Ferreira Ricardo Mateus António Baio Dias
Composition of the Sectorial Panel:	-
Consultation period:	18/11/2015 - 18/01/2016
Valid until:	01/06/2027

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

1.7. Relevant c-PCR (Complementary product category rules)

Name:	Not applicable
Issue date:	-
Number of registration on the data base:	-
Version:	-
Identification and contact of the coordinator (s):	-
Identification and contact of the authors:	-
Composition of the Sectorial Panel:	-
Consultation period:	-
Valid until:	-

1.8. Information concerning the product/product class

Identification of the product:	SIBEXTREME products																																																										
Illustration of the product:																																																											
Brief description of the product:	<p>The Extreme product range combines abilities that make it possible to create truly seamless high-performance Terrazzo floors. The SIBExtreme Style product consists in a decorative Terrazzo mortar with high mechanical strength. The SIBExtreme Flow is a highly resistant self-levelling mortar with a decorative effect. The SIBExtreme Style, SIBExtreme Loft and SIBExtreme Flow are bi-component products, composed of mortar and a liquid resin.</p> <p>Products from the SIBExtreme range are classified as high-performance decorative mortars, due to their physical and mechanical characteristics with a high resistance to abrasion. This performance can be achieved even with an application with a thickness of 10 mm.</p> <p>Table 1: Composition of the products</p> <table border="1"> <thead> <tr> <th></th> <th>SIBExtreme AF Flow</th> <th>SIBExtreme AF Loft</th> <th>SIBExtreme AG Style</th> </tr> </thead> <tbody> <tr> <td>Component A</td> <td>20kg + 30kg aggregates</td> <td>20 kg</td> <td>20 kg</td> </tr> <tr> <td>Component B (liquid)</td> <td>11 kg (9,2 l)</td> <td>3,4 to 3,6 kg (17 a 19%)</td> <td>13,6 kg (11 l)</td> </tr> <tr> <td>Component C (aggregate)</td> <td>–</td> <td>–</td> <td>30 kg</td> </tr> </tbody> </table>					SIBExtreme AF Flow	SIBExtreme AF Loft	SIBExtreme AG Style	Component A	20kg + 30kg aggregates	20 kg	20 kg	Component B (liquid)	11 kg (9,2 l)	3,4 to 3,6 kg (17 a 19%)	13,6 kg (11 l)	Component C (aggregate)	–	–	30 kg																																							
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Description of the product's application/use:	<p>Due to its technical performance, the SIBExtreme products can be used in heavy industrial applications and with the addition of special hard aggregates Extreme it withstands heavy truck traffic, vehicles, etc. It is recommended the use of the primer SIBAQUAPOX and the use of the SIBECOFILLER for the filling during the polishing process.</p>																																																										

Placing on the market / Rules of application in the market / Technical rules of the product:	Products covered by regulation (EU) No. 305/2011 require a declaration of performance (table 2 above) taking into account the harmonized European standard regulation or the European technical assessment and the CE marking.) Harmonized technical specification: EN 13813:2002 Screed material and floor screeds - Screed material – Properties and requirements
Quality control:	Factory Production Control (Aggregates): EN 12620:2002 + A1:2008; EN 13139:2002 + EN 13139:2002/AC:2004
Special delivery conditions:	Not applicable
Components and substances to declare:	Special binders – 5/40% Filler material – 10/50% Additives – 0/5% Aggregates– 10/50%
Where explanatory material may be obtained:	The raw materials are stored in silos, big bags or bags in the factory and introduced gravimetrically according to the respective formula and mixed with a controlled and timed speed. The mixture is then packaged. Quality and environmental standards by ISO 9001:2015 and the provisions described in the relevant regulations. The SIBExtreme product can be found at dealers and professional applicators.
History of the LCA studies:	Not applicable

1.9. Calculation rules of the LCA

Functional unit:	--
Declared unit:	1 kg of decorative mortar for floors
System boundaries:	EPD from cradle-to-gate with the distribution stage (A1-A3, A4)
Criteria for the exclusion:	The following processes were not considered in this study, since they fell under the cut-off criteria: <ul style="list-style-type: none"> • The environmental loads associated with the construction of industrial infrastructures and the manufacture of machinery and equipment; • The environmental loads related to the infrastructures (production of vehicles, road maintenance) of the transport of pre-products;
Assumption and limitations	This EDP is intended to represent one (1) product (and respective ranges) that can be produced in one (1) manufacturing unit.
Quality and other characteristics about the information used in the LCA:	The production data collected corresponds to the year 2021. The generic data used belong to the Ecoinvent v3.7 databases and comply with the quality criteria (age, geographical and technological coverage, plausibility, etc.) of generic data.
Allocation rules:	In the industrial unit, various powder products are manufactured using the same production process, however, each product has its specific recipe. As the company also manufactures aggregates, the breakdown of energy consumption according to the measurements and indications made by the company were also taken in consideration. A mass allocation was considered in the different mortars produced.
Software used for the assessment:	SimaPro, version 9.2
Background database used for the LCA:	Ecoinvent database version 3.7.1 published in December 2020; approach “cut-off”
Comparability of EPD for construction products	The EPD of construction products and services cannot be comparable in case they are not produced according to EN 15804 and EN 15948 and according to the comparability conditions determined by ISO 14025.

1.10. Use of average environmental performance

This EPD presents the average environmental performance at entire range of SIBExtreme products produced by SIB in 2021, with the same raw material recipe. The variability of environmental performance between specific products is not relevant.

1.11. Technical information for Reference Service Life (RSL)

Not applicable. This is a cradle-to-gate EPD with the distribution stage (A4).

1.12. Flow diagram of input and output of the processes



Figure 1: Production Process of the Mortars and Hardeners (PP2) (line 1 left, line 2 right).

Production Process of the Mortar (PP2):

The various raw materials (aggregates, fillers, special binders and additives) are transported in tanker trucks, plastic bags or big-bags, with quality control carried out on the raw materials upon receipt.

The storage of these raw materials in bulk is done in silos. As for the raw materials in bags or big-bags, it is carried out on racks to a warehouse with controlled temperature and humidity.

The final powdered product (decorative mortar for floors) is obtained from the mixture of different raw materials, based on a pre-established formulation/recipe. Raw materials are dosed automatically through scales incorporated in the production lines. The components after dosing are then discharged to be subjected to mixing and homogenization in a mixer through pneumatic valves. Mixing time varies depending on the specific composition of the product. After mixing, the product is discharged into the hopper of the bagging machine.

The last stage of the manufacturing process consists of bagging and palletizing the product. The powdered products are packaged in printed kraft paper bags using electrical equipment and then placed on a wooden pallet. Finally, pallets and bags are wrapped in stretch film.

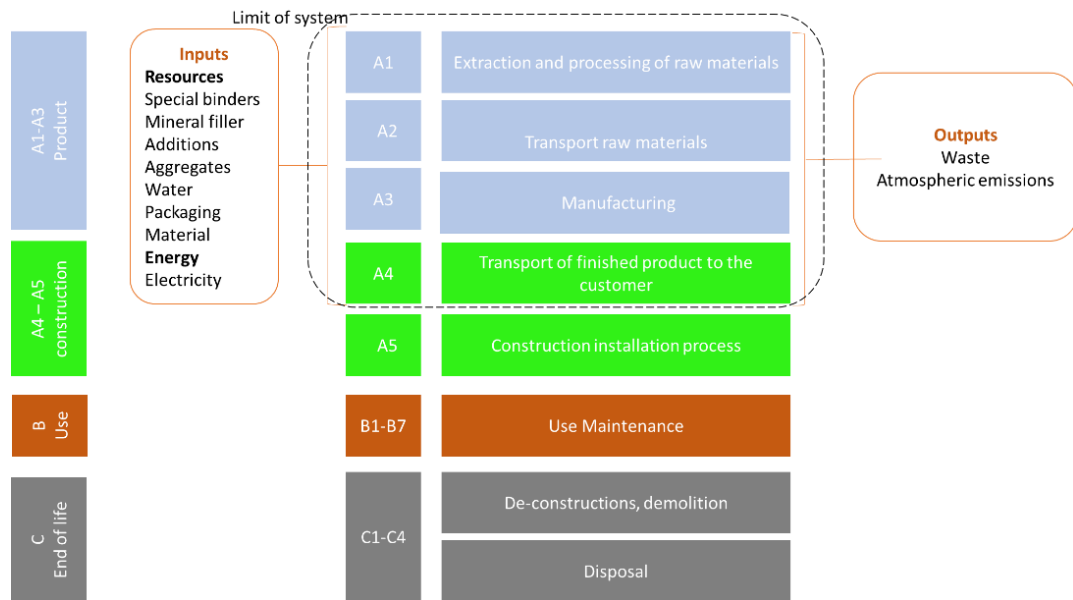


Figure 2: Production scheme – inputs and outputs (only applicable to A1, A2, A3 and A4). Excluded from borders the stage of construction, use and maintenance, demolition and final disposal.

2. CORE ENVIRONMENTAL IMPACT INDICATORS

2.1. Description of the system boundaries

(✓ = included; ND = module not declared)

PRODUCT STAGE			CONSTRUCTION PROCESS STAGE		USE STAGE							END OF LIFE STAGE				BENEFITS AND LOADS BEYOND THE SYSTEM BOUNDARY
Raw material supply	Transport	Manufacturing	Transport	Construction installation process	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-constructions, demolition	Transport	Waste processing	Disposal	Re-use, recovery, recycling potential
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
✓	✓	✓	✓	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

Modules **A1-A3** include those processes that provide energy and material input for the system (A1), transport up to the factory gate of the plant (A2), manufacturing processes (A3) as well as waste processing.

Module **A4** includes the transport from the production site to the customer or to the point of installation of the adhesive mortar. One scenario was considered for the transport: 2000 km (truck).

Module **A5** considers all adhesive mortar installation steps and packaging waste processing (recycling, incineration, disposal). It was not considered in this study.

Module **B1** considers the use of the adhesive/decorative mortar. It was not considered in this study.

Module **B2** includes the cleaning of the adhesive mortars. Provision of water, cleaning agent for the cleaning of the adhesive mortars, incl. wastewater treatment. It was not considered in this study.

Modules **B3-B4-B5** are related to the repair, replacement, and refurbishment of adhesive/decorative mortars. If the adhesive mortars are properly installed no repair, replacement or refurbishment processes are necessary, but modules B3-B4-B5 are not considered according to EN17160.

Modules **B6-B7** consider energy use for operating building integrated technical systems (B6) and operational water use for technical building-related systems. No operational energy or water use are considered. Cleaning water is declared under B2. It was not considered in this study.

Module **C1** refers to the demolition and de-construction process of the adhesive mortars from the building. It was not considered in this study.

Module **C2** considers transportation of the discarded adhesive mortars to a recycling or disposal process. It was not considered in this study.

Module **C3** considers every process (collection, crushing process etc.) properly for recycling the adhesive mortars. It was not considered in this study.

Module **C4** includes all the landfill disposal processes, including pre-treatment and management of the disposal site it was not considered in this study.

Module **D** was not considered in this study.

2.1.1. Justification for the exemption to declare modules C1, C2, C3, C4 and D

Given that this is a product that meets the three criteria defined in point 5.2 of standard EN 15804:2012+A2:2019+AC, namely:

- it is physically integrated with other materials during the application, and physically separated from the rest at the end of its useful life is not possible;
- not lethal due to end-of-life physical or chemical transformation processes and;
- this product does not contain biogenic carbon

may be exempt from declaring modules C1, C2, C3, C4 and D.

2.2. Core environmental impact indicators

		Global warming potential total; GWP-total	Global warming potential fossil; GWP-fossil	Global warming potential biogenic; GWP-biogenic	Global warming potential land use and land use change; GWP-luluc	Depletion potential of the stratospheric ozone layer; ODP	Acidification potential; AP
Unit		kg CO ₂ eq.	kg CO ₂ eq.	kg CO ₂ eq.	kg CO ₂ eq.	kg CFC 11 eq.	mol H ⁺ eq.
Module A1-A3		2.11E-01	2.39E-01	-2.77E-02	5.09E-04	2.74E-08	9.75E-04
Module A4	Scenario A4.1	2.70E-01	2.70E-01	2.16E-04	2.05E-06	6.27E-08	5.32E-04

LEGEND:
 Product stage
 Construction process stage (only A4)

Values expressed by declared unit.
Module A4 – Scenario A4.1 - The scenario considered was 2000 km (truck).

		Eutrophication potential aquatic freshwater; EP-freshwater	Eutroph. potential aquatic marine; EP-marine	Eutroph. potential terrestrial; EP-terrestrial	Formation potential of tropospheric ozone; POCP	Abiotic depletion potential for non-fossil resources ADP-minerals&metals	Abiotic depletion potential for fossil resources potential ADP-fossil	Water (user) deprivation potential; WDP
Units		kg P eq.	kg N eq.	mol N eq.	Kg CO ₂ eq.	kg Sb eq.	MJ, P.C.I	m ³ World eq. deprived
Modules A1-A3		7.71E-06	2.17E-04	2.48E-03	7.12E-04	2.63E-07	3.16E+00	6.87E-02
Module A4	Scenario A4.1	1.47E-07	8.87E-05	9.88E-04	3.49E-04	1.15E-08	3.83E+00	-8.11E-04

LEGENDA:
 Product stage
 Construction process stage (only A4)

Values expressed by declared unit.
Module A4 – Scenario A4.1 - The scenario considered was 2000 km (truck).

2.3. Additional environmental impact indicators

		Potential incidence of disease due to PM emissions PM	Potential Human exposure efficiency relative to U235 IRP	Potential Comparative Toxic Unit for ecosystems ETP-fw	Potential Comparative Toxic Unit for humans, cancer effects HTP-c	Potential Comparative Toxic Unit for humans, not cancer effects HTP-nc	Potential soil quality index SQP
Unit		Disease incidence	kBq U 235 eq.	CTUe	CTUh	CTUh	-
Modules A1-A3		1.46E-08	9.35E-03	4.84E+00	7.67E-11	4.61E-09	4.44E+00
Module A4	Scenario A4.1	1.56E-08	1.69E-02	1.53E+00	2.02E-11	2.39E-09	1.22E-02

LEGEND:
 Product stage
 Construction process stage (only A4)

The impact indicator "POTENTIAL HUMAN EXPOSURE EFFICIENCY RELATIVE TO U235" focuses mainly on the possible impact of a low dose of ionising radiation on human health resulting from the nuclear fuel cycle. It does not consider effects arising from possible nuclear accidents, occupational exposure or the disposal of radioactive waste in underground facilities. Potential ionising radiation from soil, radon and some building materials is also not measured by this indicator. The results of the indicators "POTENTIAL COMPARATIVE TOXIC UNIT FOR ECOSYSTEMS (ETP-FW)", "POTENTIAL COMPARATIVE TOXIC UNIT FOR HUMANS, CANCER EFFECTS", "POTENTIAL COMPARATIVE TOXIC UNIT FOR HUMANS, NOT CANCER EFFECTS" and "POTENTIAL SOIL QUALITY INDEX" should be used with caution as the uncertainties associated with them are high or there is little experience with the indicator.

Values expressed by declared unit.
Module A4 – Scenario A4.1 - The scenario considered was 2000 km (truck).

2.4. Indicators describing resource use

		Primary energy					
		EPR	RR	TRR	EPNR	RNR	TRNR
Unit		MJ, P.C.I.					
Modules A1-A3		4.24E-01	5.38E-01	9.62E-01	2.71E+00	6.74E-01	3.39E+00
Module A4	Scenario A4.1	5.63E-03	0.00E+00	5.63E-03	4.06E+00	0.00E+00	4.06E+00

LEGEND:
 Product stage
 Construction process stage (only A4)

EPR = use of renewable primary energy excluding renewable primary energy resources used as raw materials; RR = use of renewable primary energy resources used as raw materials; TRR = total use of renewable primary energy resources (EPR + RR); EPNR = use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials; RNR = use of non-renewable primary energy resources used as raw materials; TRNR = total use of non-renewable primary energy resources (EPNR + RNR);

Values expressed by declared unit.
Module A4 – Scenario A4.1 - The scenario considered was 2000 km (truck).

		Secondary materials and fuels, and use of water			
		MS	CSR	CSNR	Net use of fresh water
Unit		kg	MJ, P.C.I.	MJ, P.C.I.	m ³
Modules A1-A3		0.00E+00	0.00E+00	0.00E+00	1.95E-03
Module A4	Scenario A4.1	0.00E+00	0.00E+00	0.00E+00	5.75E-06

LEGEND:
 Product stage
 Construction process stage (only A4)

MS = use of secondary material; CSR = use of renewable secondary fuels; CSNR = use of non-renewable secondary fuels.

Values expressed by declared unit.
Module A4 – Scenario A4.1 - The scenario considered was 2000 km (truck).

2.5. Other environmental information describing different waste categories

		Hazardous waste disposed	Non-hazardous waste disposed	Radioactive waste disposed
Unit		kg	kg	kg
Modules A1-A3		4.35E-06	1.84E-02	1.12E-05
Module A4	Scenario A4.1	1.01E-05	1.60E-04	2.77E-05

LEGEND:
 Product stage
 Construction process stage (only A4)

The characteristics that make waste hazardous are described in the applicable legislation, for example in the Waste Directive (UE).

Values expressed by declared unit.
Module A4 – Scenario A4.1 - The scenario considered was 2000 km (truck).

2.6. Environmental information describing output flows

		Components for re-use	Materials for recycling	Materials for energy recovery	Exported energy		
					Energy carrier 1	...	Energy carrier n
Unit		kg	kg	kg	MJ	MJ	MJ
Modules A1-A3		0.00E+00	9.07E-03	3.35E-03	0.00E+00	--	--
Module A4	Scenario A4.1	0.00E+00	0.00E+00	0.00E+00	0.00E+00	--	--

LEGEND:
 Product stage
 Construction process stage (only A4)

The characteristics that make waste hazardous are described in the applicable legislation, for example in the Waste Directive (UE).

Values expressed by declared unit.
Module A4 – Scenario A4.1 - The scenario considered was 2000 km (truck).

2.7. Information describing the biogenic carbon content at the factory gate

Biogenic carbon content*	Units**	Modules A1-A3 (results)
Biogenic carbon content in product	kg C	Not applicable
Biogenic carbon content in accompanying packaging	kg C	Not applicable
<p>* 1 kg biogenic carbon is equivalent to 44/12 kg of CO₂.</p> <p>** This information can be omitted whenever the content of biogenic carbon in the product, or in the respective packaging, is less than 5% of the mass of the product, or the respective packaging.</p>		

The analyzed products do not contain biogenic carbon, except for some materials present in the primary packaging (paper bags) and secondary packaging (wooden pallets and cardboard boards). Since its weight does not exceed the limit of 5% concerning the total mass of the product, it is not necessary to declare biogenic carbon, as indicated in EN 15804:2012+A2+AC.

3. SCENARIOS AND ADDITIONAL TECHNICAL INFORMATION

3.1. A4 Transport to the building site – Construction process stage

Parameter	Units*/comments	Scenario A4.1
Scenario	Name and description of the scenario	Transport to central Europe
Related scenario	Name of the scenarios linked to this scenario	-
Fuel type and consumption of vehicle or vehicle type used for transport e.g. long-distance truck, boat, etc.	Litre of fuel type per distance, or vehicle type**	Road transport by truck (16-32 ton class EURO 6)
Distance	km	2000
Capacity utilization (including empty returns)	%	24ton
Bulk density of transported products	kg/m ³	1.2
Volume capacity utilization factor (factor: =1 or < 1 or ≥ 1 for compressed or nested packaged products)	Not applicable	NA

3.2. Additional information on release of dangerous substances to indoor air, soil, and water during the use stage

Volatile Organic Compound (VOC) emission tests were carried out on two products, in accordance with ISO 16000 parts 3, 6, 9 and 11 and CN/TS 16516. The products were fed into emission chambers in order to detect their VOC emissions after 3 and 28 days of storage in the ventilated chambers, according to the GEV test method (Gemeinschaft Emissionskontrollierte Verlegewerkstoffe, Klebstoffe und Bauprodukte e.V.). SIBExtreme products have been proven to meet the requirements for the Emissioncode EC1RPLUS emission class, such as “very low VOC emission”.

Parameter (a)	Unit	Result	Additional considerations
COVT after 3 days	µg/m ³	≤ 750	Product classified as: “EC1 PLUS – very low emission” by GEV “VOC emissions and content specifications in LEED EQ credit “Low-emitting products””
COVT after 28 days	µg/m ³	≤ 60	
COSVT after 28 days	µg/m ³	≤ 40	
R value based on German AgBB LCI (NIK) after 28 days	µg/m ³	1	
Sum of non-assessable VOCs	µg/m ³	≤ 40	
Formaldehyde after 3 days	µg/m ³	≤ 50	
Acetaldehyde after 3 days	µg/m ³	≤ 50	
Sum of form- and Acetaldehyde	µg/m ³	≤ 0,05	
Sum of C1A/C1B volatile after 3 days	µg/m ³	≤ 10	
Any C1A/C1B volatile after 28 days	µg/m ³	≤ 1	
Sum COVT + COSVT + COVVT after 28 days	µg/m ³	≤ 100 max. 40 SVOC	

(a) (According to the horizontal standards on the measurement of the release of regulated hazardous substances from construction products, using harmonised test methods in accordance with the provisions of the respective Technical Committees for European product standards, when available.

4. REFERENCES

- ✓ General Instructions of the DAPHabitat System, Version 2.1, Edition August 2023 (in www.daphabitat.pt);
- ✓ PCR – basic module for construction products and services. DAPHabitat System. Version 2.3, August 2023 (in www.daphabitat.pt);
- ✓ ISO 14025:2009 Environmental declarations and labels – Type III environmental declarations – Principles and procedures;
- ✓ EN 15804:2012 + A2:2019 Sustainability of construction works – Environmental product declarations – Core rules for the product category of construction products;
- ✓ EN 15942:2021 Sustainability of construction works – Environmental product declarations – Communication format business-to-business.