

SUSTAINABILITY CONTRIBUTION DECLARATION

BREEAM®

(Building Research Establishment Environmental Assessment Method, NEW CONSTRUCTION 2016)



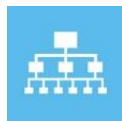
Ceramic tiles and panels

Ceramic tiles produced by extrusion or dry pressing used for internal and external floorings and walls.

For example:

- bathroom, kitchen, entrance, hall, living room and bedroom etc.
- terrace, balcony, facades etc.
- commercial and industrial use

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Management

Man 02: Life cycle cost and service life planning

→ To deliver whole life value from investment and promote economic sustainability by recognising and encouraging the use and sharing of life cycle costing and service life planning.

Product information

Specific information	Evidence (quality)
Construction process stage	-
Use stage	Reference service life (RSL): Equivalent to the service life of the building or 50 years Maintenance: damp mopping with water 2 ml/m ²) and detergent (0.0003 kg/m ²). For flooring: 52 times per year For walls: 4 times per year
End of life stage	93,9 % material recovery with benefits beyond the system boundary for use as aggregate. 6,1 % landfill. (source: bbs, Kreislaufwirtschaft Bau; Mineralische Bauabfälle Monitoring 2018)

Man 04: Commissioning and handover

→ To encourage a properly planned handover and commissioning process that reflects the needs of the building occupants.

Product information

Product specific information for the Building User Guide (BUG) (installation, maintenance)	Evidence (quality)
Installation and maintenance instructions are provided in a technical manual.	Link to the relevant documentation: https://agrob-buchtal.de/en/architect-planner/service

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Health and Wellbeing

Not relevant for this product, as the ceramic tiles don't emit VOC's.



Energy

Not relevant for this product (only for products that use energy).



Water

Not relevant for this product (only for products that use water).



Materials

Mat 01: Life cycle impacts

→ To recognise and encourage the use of construction materials with a low environmental impact (including embodied carbon) over the full life cycle of the building.

Product information

Description	Value	Link
"Product specific" environmental product declaration available?	yes	See below
EPD Program Operator	Institute Construction and Environment (IBU - Institut Bauen und Umwelt e.V.), Berlin, Germany	http://ibu-epd.com/en/
Author of the LCA	LCEE Life Cycle Engineering Experts GmbH, Darmstadt, Germany	https://www.LCEE.de/
EPD Number	EPD-BKF-20220184-ICG1-DE	https://ibu-epd.com/en/published-epds/
System boundaries	Cradle to grave	-
Declared unit	1 m ²	-
PCR	Ceramic tiles and panels	-
Green guide rating	See generic Green guide ratings for ceramic floor tiles at www.bre.co.uk/greenguide	e.g. element number 821580001 with an B summary rating

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Results of the LCA – ENVIRONMENTAL IMPACTS

Life cycle stages	Product stage	Construction process stage		Use stage	End of life stage				Benefits and loads beyond the system boundaries	
		A4	A5		B2	C1	C2	C3	C4	D
Declared life cycle stages (DIN EN 15978)	A1-A3	A4	A5	B2	C1	C2	C3	C4	D	D/1
GWP-total [kg CO ₂ -Äq.]	9,47 E+00	3,32 E-01	2,33 E-01	2,62 E-04	1,36 E-03	2,19 E-02	4,54 E-02	1,64 E-02	-4,03 E-02	-4,98 E-02
GWP-fossil [kg CO ₂ -Äq.]	9,43 E+00	3,29 E-01	6,70 E-02	2,59 E-04	1,00 E-03	2,18 E-02	4,50 E-02	1,68 E-02	-4,01 E-02	-4,96 E-02
GWP-biogenic [kg CO ₂ -Äq.]	4,33 E-02	1,66 E-04	1,66 E-01	2,26 E-06	3,14 E-04	1,10 E-05	1,16 E-04	4,87 E-04	-2,98 E-05	-1,73 E-04
GWP-luluc [kg CO ₂ -Äq.]	7,39 E-03	2,14 E-03	3,59 E-06	7,31 E-08	4,60 E-05	1,42 E-04	2,46 E-04	4,94 E-05	-1,83 E-04	-2,31 E-06
ODP [kg CFC11-Äq.]	2,89 E-13	8,54 E-17	4,11 E-17	6,60 E-19	1,83 E-18	5,65 E-18	2,01 E-16	6,59 E-17	-5,18 E-16	-4,07 E-18
AP [kg SO ₂ -Äq.]	1,07 E-02	2,83 E-03	5,69 E-05	2,92 E-07	3,61 E-06	1,87 E-04	4,19 E-04	1,20 E-04	-1,33 E-04	-3,12 E-05
EP-freshwater [kg PO ₄ ³⁻ Äq.]	1,06 E-05	6,86 E-07	7,07 E-09	1,39 E-09	1,47 E-08	4,54 E-08	1,02 E-07	2,83 E-08	-1,12 E-07	-5,00 E-09
EP-marine [kg PO ₄ ³⁻ Äq.]	4,50 E-03	1,43 E-03	1,87 E-05	1,12 E-07	6,38 E-07	9,44 E-05	2,07 E-04	3,10 E-05	-5,16 E-05	-1,43 E-05
EP-terrestrial [kg PO ₄ ³⁻ Äq.]	4,91 E-02	1,57 E-02	2,59 E-04	1,18 E-06	8,89 E-06	1,04 E-03	2,28 E-03	3,41 E-04	-5,68 E-04	-1,57 E-04
POCP [kg Ethen Äq.]	1,14 E-02	2,64 E-03	4,97 E-05	3,38 E-07	2,66 E-06	1,75 E-04	6,03 E-04	9,41 E-05	-1,22 E-04	-4,07 E-05
ADPE [kg Sb Äq.]	1,38 E-06	2,90 E-08	6,22 E-10	3,85 E-11	6,24 E-10	1,92 E-09	4,96 E-08	1,59 E-09	-8,19 E-09	-3,91 E-09
ADPF [MJ]	1,52 E+02	4,42 E+00	6,42 E-02	7,18 E-03	9,50 E-02	2,93 E-01	8,49 E-01	2,23 E-01	-5,29 E-01	-8,72 E-05
WDP [m ³ Welt-Äq. Entzogen]	9,04 E-01	1,30 E-03	2,68 E-02	4,31 E-03	2,79 E-05	8,58 E-05	7,56 E-03	1,80 E-03	-9,77 E-04	-2,89 E-05

Note: Two scenarios were assessed. Scenario 1 (D): 93,9 % material recovery with benefits beyond the system boundary for the aggregate and 6,1 % landfill. Scenario 2 (D/1): benefits beyond the system boundary for thermal recycling of packaging from modul A5.

Detailed names of the given abbreviations can be found in the Glossary.

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Results of the LCA – RESOURCE USE

Life cycle stages	Product stage	Construction process stage		Use stage	End of life stage				Benefits and loads beyond the system boundaries	
		A4	A5		B2	C1	C2	C3	C4	D
Declared life cycle stages (DIN EN 15978)	A1-A3	A4	A5	B2	C1	C2	C3	C4	D	D/1
PERE [MJ]	1,67 E+01	2,57 E-01	1,93 E+0	5,52 E-03	5,52 E-03	1,70 E-02	7,50 E-02	3,01 E-02	-1,44 E-01	-2,04 E-03
PERM [MJ]	1,92 E+00	0,00 E+00	-1,93 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00
PERT [MJ]	1,86 E+01	2,57 E-01	1,23 E-02	5,52 E-03	5,52 E-03	1,70 E-02	7,50 E-02	3,01 E-02	-1,44 E-01	-2,04 E-03
PENRE [MJ]	1,52 E+02	4,42 E+00	4,74 E-01	9,50 E-02	9,50 E-02	2,93 E-01	8,49 E-01	2,23 E-01	-5,29 E-01	-8,72 E-01
PENRM [MJ]	4,10 E-01	0,00 E+00	-4,10 E-01	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00
PENRT [MJ]	1,52 E+02	4,42 E+00	6,42 E-02	9,50 E-02	9,50 E-02	2,93 E-01	8,49 E-01	2,23 E-01	-5,29 E-01	-8,72 E-01
SM [kg]	1,02 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	1,69 E+01	0,00 E+00
RSF [MJ]	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00
NRSF [MJ]	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00
FW [m³]	2,84 E-02	2,28 E-04	6,30 E-04	4,90 E-06	4,90 E-06	1,51 E-05	2,20 E-04	5,49 E-05	-8,73 E-05	-2,86 E-06

Results of the LCA – OUTPUT FLOWS AND WASTE CATEGORIES for the declared unit

Life cycle stages	Product stage	Construction process stage		Use stage	End of life stage				Benefits and loads beyond the system boundaries	
		A4	A5		B2	C1	C2	C3	C4	D
Declared life cycle stages (DIN EN 15978)	A1-A3	A4	A5	B2	C1	C2	C3	C4	D	D/1
HWD [kg]	5,50 E-08	1,94 E-06	1,89 E-04	1,05 E-12	3,97 E-12	1,22 E-11	4,93 E-11	2,37 E-11	-8,52 E-11	-2,48 E-10
NHWD [kg]	1,63 E-01	9,13 E-03	-1,31 E-02	3,02 E-05	1,53 E-05	4,72 E-05	2,44 E-04	1,11 E+00	-3,51 E-01	-2,75 E-04
RWD [kg]	2,03 E-03	5,47 E-05	1,40 E-04	2,45 E-08	9,12 E-08	2,81 E-07	6,25 E-06	2,30 E-06	-1,56 E-05	-2,08 E-07
CRU [kg]	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00
MFR [kg]	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	1,69 E+01	0,00 E+00	0,00 E+00	0,00 E+00
MER [kg]	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00
EEE [MJ]	0,00 E+00	0,00 E+00	3,71 E-01	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00
EET [MJ]	0,00 E+00	0,00 E+00	7,30 E-01	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00

SUSTAINABILITY CONTRIBUTION DECLARATION



Materials

Mat 05: Designing for durability and resilience

→ To recognise and encourage adequate protection of exposed elements of the building and landscape, therefore minimising the frequency of replacement and maximising materials.

Product information

Item	Description
Durability improvement	No maintenance; very durable product. Reference service life is equal to service life of the building or 50 years.



Waste

Wst 01: Construction waste management

→ To promote resource efficiency via the effective management and reduction of construction waste.

Product information

Specific information	Evidence (quality)
Reduction of construction waste	Construction waste is reduced as the product can be cut into the required sizes and nearly all cutting remnants can be used during installation.
Recycling rate of construction waste	93,9 % of wastes are recycled (source: bbs, Kreislaufwirtschaft Bau; Mineralische Bauabfälle Monitoring 2018)



Pollution

Not relevant for this product, because the tiles are not emitting any substances.

SUSTAINABILITY CONTRIBUTION DECLARATION

General Information

Company name: AGROB BUCHTAL GmbH
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Homepage: www.agrob-buchtal.de
Date: 10.03.2023

Technical data

Following technical data at delivery state are relevant for the declared product:

Name	thickness [mm]	density [kg/m ³]	Surface weight [kg/m ²]
Ceramic tiles and panels	9	1.996	17,97

Average mass shares of main components:

Component	
Clay	ca. 45 - 60 %
Feldspar	ca. 25 %
Kaolin	ca. 7%
Limestone	ca. 3%
Sand	ca. 3%
Glaze	ca. 4%

SUSTAINABILITY CONTRIBUTION DECLARATION

Glossary

GWP	Global warming potential
ODP	Depletion potential of the stratospheric ozone layer
AP	Acidification potential of land and water
EP	Eutrophication potential
POCP	Formation potential of tropospheric ozone photochemical oxidants
ADPE	Abiotic depletion potential for non-fossil resources
ADPF	Abiotic depletion potential for fossil resources
WDP	Water deprivation potential
PERE	Use of renewable primary energy excluding renewable primary energy resources used as raw materials
PERM	Use of renewable primary energy resources used as raw materials
PERT	Total use of renewable primary energy resources
PENRE	Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials
PENRM	Use of non-renewable primary energy resources used as raw materials
PENRT	Total use of non-renewable primary energy resources
SM	Use of secondary material
RSF	Use of renewable secondary fuels
NRSF	Use of non-renewable secondary fuels
FW	Use of net fresh water
HWD	Hazardous waste disposed
NHWD	Non-hazardous waste disposed
RWD	Radioactive waste disposed
CRU	Components for re-use
MFR	Materials for recycling
MER	Materials for energy recovery
EE	Exported energy per energy carrier
BUG	Building User Guide: Dedicated building/site specific guidance for the non-technical building user. The purpose of the guide is to help building users access, understand and operate the building efficiently and in a manner in keeping with the original design intent. A Building User Guide will provide easily accessible and understandable information relevant to the following stakeholders: <ul style="list-style-type: none">- The building's staff (or where relevant residents)- The non-technical facilities management team/building manager- Other building users, e.g. visitors/community users

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