

Environmental Product Declaration

according to ISO 14025 and EN 15804



This declaration is for:
Tegalit

Provided by:
BMI Steildach GmbH



program operator
Stichting MRPI®
publisher
Stichting MRPI®
www.mrpi.nl

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1.1.00265.2022
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COMPANY INFORMATION



Braas und Schwenkstraße 50
59368
Altheim, Austria
wouterjan.vanden.berg@bmigroup.com
www.bmigroup.com

PRODUCT

Tegalit

DECLARED UNIT/FUNCTIONAL UNIT

m²

DESCRIPTION OF PRODUCT

A m² of concrete roofing tile, as produced (not attached to the roof, gradle to gate)

VISUAL PRODUCT



MRPI® REGISTRATION

1.1.00265.2022

DATE OF ISSUE

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MORE INFORMATION

<https://www.bmigroup.com/our-solutions/pitched-roofs/concrete-tiles/>

SCOPE OF DECLARATION

This MRPI®-EPD certificate is verified by **Kamiel Jansen, Aveco de Bondt**.

The LCA study has been done by **Wouter Jan van den Berg, BMI Group**.

The certificate is based on an LCA-dossier according to ISO14025 and EN15804+A1. It is verified according to the 'MRPI®-EPD verification protocol November 2020.v4.0'. EPDs of construction products may not be comparable if they do not comply with EN15804+A1. Declaration of SVHC that are listed on the 'Candidate List of Substances of Very High Concern for authorisation' when content exceeds the limits for registration with ECHA.

PROGRAM OPERATOR

Stichting MRPI®
Kingsfordweg 151
1043GR
Amsterdam



ir. J-P den Hollander, Managing director MRPI®

DEMONSTRATION OF VERIFICATION

CEN standard EN15804 serves as the core PCR[a]

Independent verification of the declaration and data,

according to EN ISO 14025:2010:

internal: external: X

Third party verifier:

Kamiel Jansen, Aveco de Bondt

[a] PCR = Product Category Rules

DETAILED PRODUCT DESCRIPTION

Concrete roof tiles are made from the natural raw materials: sand, cement and water. We color that mixture with natural iron oxide, so that the color is retained for a long time. Tiles are extruded using aluminium pallets. After curing, we finish the concrete roof tiles with an innovative top layer developed by our own research department. In recent decades, concrete roof tiles have developed enormously in terms of quality and offer aesthetic reliability for many years. For concrete roof tiles with a Glazuron finish, we apply a thin extra layer, which consists of fine sand, provided with coloring based on iron oxides.

The Reference Service Life (RSL) of Tegalit is 60 years.

COMPONENT (> 1%)	[kg / %]
Sand	confidential
Cement	confidential
Pigment	confidential
Water	confidential

(*) > 1% of total mass

SCOPE AND TYPE

The Tegalit concrete tiles are produced at the location of BMI Steildach GmbH (Altheim) and they are applied at the European market.

The background database is Ecoinvent version 3.6. It is a specific EPD for a specific product and the type of this EPD is Cradle-to-Gate. The life cycle stages included are shown next.

PRODUCT STAGE	CONSTRUCTION										USE STAGE							END OF LIFE				BENEFITS AND
	PROCESS																	STAGE				LOADS BEYOND THE
	STAGE																					SYSTEM BOUNDARIES
Raw material supply	Transport	Manufacturing	Transport gate to site	Assembly	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction demolition	Transport	Waste processing	Disposal	Reuse-Recovery-Recycling-potential						
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D						
x	x	x	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND					

X = Modules Assessed

ND = Not Declared

LCA Processflow tile production

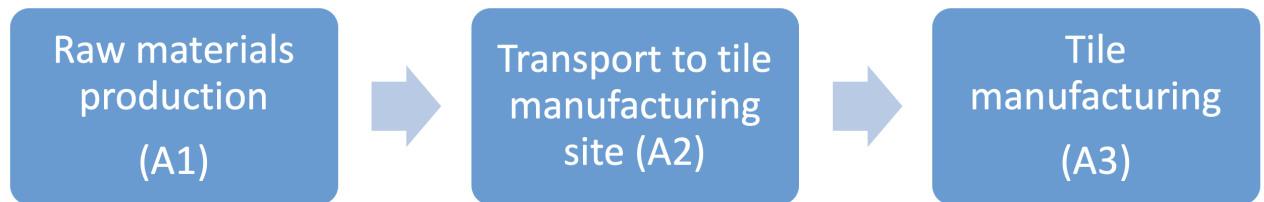


Figure: LCA process diagram according to EN 15804(7.2.1)

REPRESENTATIVENESS

The input data are representative for Tegalit, a product of BMI. The data are representative for the EU market.

ENVIRONMENTAL IMPACT per functional unit or declared unit (indicators A1)

	UNIT	A1	A2	A3	A1-A3
ADPE	kg Sb eq.	3.22E-5	4.34E-5	1.45E-5	9.00E-5
ADPF	MJ	2.29E+1	2.54E+1	3.01E+1	7.84E+1
GWP	kg CO2 eq.	9.93E+0	1.70E+0	1.55E+0	1.32E+1
ODP	kg CFC11 eq.	2.23E-7	3.01E-7	2.70E-7	7.94E-7
POCP	kg ethene eq.	1.39E-3	1.02E-3	1.01E-3	3.43E-3
AP	kg SO2 eq.	1.46E-2	7.47E-3	6.43E-3	2.85E-2
EP	kg (PO4)3- eq.	5.22E-3	1.47E-3	1.26E-3	7.95E-3

ADPE = Abiotic Depletion Potential for non-fossil resources

ADPF = Abiotic Depletion Potential for fossil resources

GWP = Global Warming Potential

ODP = Depletion potential of the stratospheric ozone layer

POCP = Formation potential of tropospheric ozone photochemical oxidants

AP = Acidification Potential of land and water

EP = Eutrophication Potential

RESOURCE USE per functional unit or declared unit (A1 / A2)

	UNIT	A1	A2	A3	A1-A3
PERE	MJ	9.04E+0	3.23E-1	3.48E+0	1.28E+1
PERM	MJ	0.00	0.00	0.00	0.00
PERT	MJ	5.49E+0	3.23E-1	3.37E+0	9.19E+0
PENRE	MJ	4.24E+1	2.74E+1	3.06E+1	1.00E+2
PENRM	MJ	3.31E+0	0.00	4.11E+0	7.41E+0
PENRT	MJ	3.10E+1	2.74E+1	3.43E+1	9.27E+1
SM	MJ	6.91E-1	0.00	2.07E-2	7.11E-1
RSF	MJ	2.10E+1	0.00	6.29E-1	2.16E+1
NRSF	MJ	3.69E+1	0.00	1.11E+0	3.81E+1
FW	m3	1.58E-1	3.15E-3	1.73E-2	1.78E-1

PERE = Use of renewable energy excluding renewable primary energy resources

PERM = Use of renewable energy resources used as raw materials

PERT = Total use of renewable primary energy resources

PENRE = Use of non-renewable primary energy resources excluding non-renewable 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 materials

RSF = Use of renewable secondary fuels

NRSF = Use of non renewable secondary fuels

FW = Use of net fresh water

OUTPUT FLOWS AND WASTE CATEGORIES per functional unit or declared unit (A1 / A2)

	UNIT	A1	A2	A3	A1-A3
HWD	kg	7.89E-5	6.55E-5	5.41E-5	1.99E-4
NHWD	kg	3.36E-1	1.64E+0	1.83E-1	2.16E+0
RWD	kg	5.20E-5	1.70E-4	1.48E-4	3.70E-4
CRU	kg	0.00	0.00	0.00	0.00
MFR	kg	0.00	0.00	1.72E+0	1.72E+0
MER	kg	0.00	0.00	0.00	0.00
EEE	MJ	0.00	0.00	0.00	0.00
ETE	MJ	0.00	0.00	0.00	0.00

HWD = Hazardous Waste Disposed

RWD = Radioactive Waste Disposed

MFR = Materials for recycling

EEE = Exported Electrical Energy

NHWD = Non Hazardous Waste Disposed

CRU = Components for reuse

MER = Materials for energy recovery

ETE = Exported Thermal Energy

CALCULATION RULES

In the Life cycle assessment the following is included in this study: Production (A1-A3).

The production stage of the Tegalit tiles consists of the extraction of raw materials, transportation of the raw materials, processing the raw materials into materials and the production of the product. The required energy for production, external treatments, ancillary materials, packaging material and production emissions are included.

Cut-off criteria

Measurement of on-site emissions were performed by BMI and those emissions were considered. The specific emissions that are linked to the provision of thermal and electrical energy are also considered in the specific processes. All reported data were incorporated and modelled using the best available LCI data. Data for the sites were cross-checked with one another to identify potential data gaps. No processes, materials or emissions that are known to make a significant contribution to the environmental impact of the studied products have been omitted. On this basis, there is no evidence to suggest that input or output contributing more than 1% to the overall mass or energy of the system - or that are environmentally significant - have been omitted.

Assumptions and approximations

In this study, primary data was used to model all on-site processes. This data was cross-checked to identify and eliminate data gaps. Secondary data (from the Ecoinvent database) was as technologically and geographically representative as possible.

Data quality

The foreground data collected by the manufacturer are based on yearly production amounts and extrapolations of measurements on specific machines and plants. The production data refer to the year 2019. Most of the necessary life cycle inventories for the basic materials are available in the Ecoinvent (v3.6) database.

SCENARIOS AND ADDITIONAL TECHNICAL INFORMATION

In the Life cycle assessment the following is included in this study:

Product stage (A1-A3)

The production stage consists of the extraction of raw materials, transportation of the raw materials, processing the raw materials into materials and the production of the product. The required energy for production, external treatments, ancillary materials, packaging material and production emissions are included.

DECLARATION OF SVHC

None of the substances contained in the product are listed in the "Candidate List of Substances of Very High Concern for authorisation", or they do not exceed the threshold with the European Chemicals Agency.

REFERENCES

ISO 14040

- DIN EN ISO 14040:2006-10, Environmental management - Life cycle assessment - Principles and framework; EN ISO 14040:2006

ISO 14044

- DIN EN ISO 14044:2006-10, Environmental management - Life cycle assessment - Requirements and guidelines; EN ISO 14040:2006

ISO 14025

- DIN EN ISO 14025:2011-10: Environmental labels and declarations — Type III environmental declarations — Principles and procedures

EN 15804

- EN 15804:2012-04+A1 2013: Sustainability of construction works — Environmental Product Declarations — Core rules for the product category of construction products

Product Category Rules EN15804: NPCR 022 version 2.0

- PCR – Part B for Roof waterproofing, version 1.0

REMARKS

None