

**Environmental
Product
Declaration**

according to ISO 14025 and EN 15804



This declaration is for:
Heraklith, homogeneous board

Provided by:
Knauf Insulation SPRL



program operator

Stichting MRPI®

publisher

Stichting MRPI®

www.mrpi.nl

MRPI® registration

1.1.00099.2020

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PROGRAM OPERATOR

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COMPANY INFORMATION

Heraklith®

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SCOPE OF DECLARATION

This MRPI®-EPD certificate is verified by **Pieter Stadhouders, Ecoreview**.

The LCA study has been done by **Dries Van Hout; Quentin Lancrenon, Greenfish**.

The certificate is based on an LCA-dossier according to ISO14025 and NEN-EN15804+A1. It is verified according to the 'EPD-MRPI® verification protocol May 2017.v3.1'. EPDs of construction products may not be comparable if they do not comply with NEN-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.

VISUAL PRODUCT



PRODUCT

Heraklith, homogeneous board

MRPI® REGISTRATION

1.1.00099.2020

DATE OF ISSUE

21-02-2020

EXPIRY DATE

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DECLARED UNIT/FUNCTIONAL UNIT

1m² Heraklith white with a thickness of 25 mm, a density of 420 kg/m³ and an R-value of 0,28 m²K/W

DESCRIPTION OF PRODUCT

Heraklith is a wood wool homogeneous product that is used as an insulation board. The product is painted in white on one side.

MORE INFORMATION

<https://www.heraklith.com/>

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

(where appropriate[b]) Third party verifier:

Pieter Stadhouders, Ecoreview

[a] Product Category Rules [b] Optional for B-to-B communication, mandatory for B-to-C communication (see EN ISO 14025:2010, 9.4).

DETAILED PRODUCT DESCRIPTION

The production process of wood wool insulation boards consists of three main processes:

1. Moulding: Preparation and blending of the raw materials followed by deposition of the mixture in a mould of the corresponding size;
2. Demoulding: Demoulding and drying of the products;
3. Finishing: Various sizing, forming, cutting and painting operations applied to the boards.

Product is delivered on pallets packaged with plastic film and cardboard protection. The estimated reference service life for the wood wool insulation boards is about 50 years, as long as the building equipment in which it is used. No maintenance is conducted during the lifetime.

COMPONENT (> 1%)	[kg / %]
Cement	51-53%
Spruce wood	33-31%
Water	10-11%
Paint	2%

(*) > 1% of total mass

SCOPE AND TYPE

The production is carried out at two different plants: Simbach (Germany) & Zalaegerszeg (Hungary). The wood wool boards are sold on the EU market. The product's end of life scenario has been modelled with a European view and can comply with the Netherlands. Background references are sourced from Ecoinvent 3.4 database, with two NMD V3.0 additions, the EPD of the supplier is used for modelling cement. The LCA is conducted with Ecochain software. It is a specific EPD.

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	X	X	X	X	X	X	X	X	X	X	X	X	X	X

X = Module assessed

MNA = Module not assessed

REPRESENTATIVENESS

The production of Heraklith in the Knauf Insulation plants in Simbach & Zalaegerszeg is representative for the EU market.

ENVIRONMENTAL IMPACT per functional unit or declared unit

	UNIT	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
ADPE	kg Sb-eq.	1.25 E -5	7.83 E -7	-4.51 E -6	8.79 E -6	3.18 E -6	-4.05 E -5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.83 E -7	2.15 E -4	9.92 E -8	-1.27 E -8
ADPF	MJ	2.83 E -2	1.87 E -3	8.41 E -3	3.86 E -2	7.61 E -3	9.96 E -4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.75 E -4	2.07 E -4	1.43 E -3	-1.80 E -3
GWP	kg CO2-eq.	1.68 E +0	2.58 E -1	1.71 E +0	3.65 E +0	1.05 E +0	1.11 E -1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	9.30 E -2	1.17 E +0	9.24 E -2	-1.97 E -1
ODP	kg CFC11-eq.	2.77 E -7	4.78 E -8	1.20 E -7	4.44 E -7	1.94 E -7	1.19 E -8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.72 E -8	4.48 E -9	3.66 E -8	-2.26 E -8
POCP	kg ethene-eq.	2.41 E -3	1.29 E -4	4.46 E -4	2.99 E -3	5.24 E -4	1.19 E -4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.66 E -5	7.69 E -6	1.00 E -4	-2.77 E -5
AP	kg SO2-eq.	2.30 E -2	8.20 E -4	3.93 E -3	2.77 E -2	3.33 E -3	7.18 E -4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.96 E -4	2.70 E -4	6.80 E -4	-1.28 E -4
EP	kg (PO4)3--eq.	3.32 E -3	1.54 E -4	8.87 E -4	4.36 E -3	6.26 E -4	1.01 E -4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.56 E -5	8.69 E -5	1.44 E -4	-1.88 E -5
Toxicity indicators (Dutch market)																			
HTP	kg DCB-eq.	1.19 E +0	9.63 E -2	2.48 E -1	1.54 E +0	3.92 E -1	4.65 E -2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.48 E -2	1.18 E -1	4.09 E -2	-1.00 E -2
FAETP	kg DCB-eq.	1.05 E -1	2.67 E -3	4.12 E -2	1.49 E -1	1.09 E -2	3.08 E -3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	9.64 E -4	3.38 E -2	9.94 E -4	-1.15 E -4
MAETP	kg DCB-eq.	1.46 E +2	1.03 E +1	2.33 E +2	3.89 E +2	4.17 E +1	9.69 E +0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.70 E +0	3.21 E +2	3.33 E +0	-5.25 E -1
TETP	kg DCB-eq.	1.26 E -2	3.42 E -4	2.43 E -3	1.54 E -2	1.39 E -3	-5.49 E -4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.24 E -4	7.78 E -4	9.43 E -5	-3.17 E -5
Environmental Cost Indicator (Dutch market)																			
ECI	Euro	3.41 E -1	2.79 E -2	1.59 E -1	5.28 E -1	1.13 E -1	1.50 E -2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.01 E -2	1.04 E -1	1.31 E -2	-1.18 E -2

INA = Indicator Not Assessed

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

HTP = Human Toxicity Potential

FAETP = Fresh water aquatic ecotoxicity potential

MAETP = Marine aquatic ecotoxicity potential

TETP = Terrestrial ecotoxicity potential

ECI = Environmental Cost Indicator

RESOURCE USE per functional unit or declared unit

	UNIT	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
PERE	MJ	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PERM	MJ	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PERT	MJ	1.49 E +2	5.75 E -2	1.93 E -1	1.49 E +2	2.34 E -1	-1.50 E +0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.08 E -2	1.34 E -2	4.01 E -2	-5.76 E -3
PENRE	MJ	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PENRM	MJ	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PENRT	MJ	5.99 E +1	4.22 E +0	2.17 E +1	8.58 E +1	1.71 E +1	2.22 E +0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.52 E +0	4.46 E -1	3.27 E +0	-3.87 E +0
SM	kg	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
RSF	MJ	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NRSF	MJ	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
FW	m3	2.63 E -2	6.74 E -4	8.37 E -3	3.54 E -2	2.74 E -3	2.81 E -3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.43 E -4	1.74 E -3	3.41 E -3	-3.56 E -4

INA = Indicator Not Assessed

PERE = Use of renewable energy excluding renewable primary energy resources

PERM = Use of renewable energy resources used as raw materials

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

SM = Use of secondary materials

NRSF = Use of non renewable secondary fuels

PERT = Total use of renewable primary energy resources

PENRT = Total use of non-renewable primary energy resources

RSF = Use of renewable secondary fuels

FW = Use of net fresh water

OUTPUT FLOWS AND WASTE CATEGORIES per functional unit or declared unit

	UNIT	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
HWD	kg	2.14 E -4	2.95 E -5	1.38 E -4	3.82 E -4	1.20 E -4	2.83 E -6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.07 E -5	2.63 E -6	2.20 E -5	-5.81 E -6
NHWD	kg	6.24 E -1	1.88 E -1	4.09 E -1	1.22 E +0	7.65 E -1	5.91 E -1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.79 E -2	3.24 E -1	2.15 E +1	-1.07 E -3
RWD	kg	1.05 E -4	2.72 E -5	1.10 E -4	2.42 E -4	1.11 E -4	8.01 E -6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	9.83 E -6	1.41 E -6	2.10 E -5	-1.62 E -6
CRU	kg	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MFR	kg	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MER	kg	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EEE	MJ	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ETE	MJ	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

INA = Indicator Not Assessed

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

All relevant inputs and outputs - like emissions, energy and materials - have been taken into account in this LCA. And in accordance with EN 15804, the total neglected input flows per module do not exceed 5% of energy usage and mass. In a LCA, the environmental burden is often divided over several product systems. In this LCA, the waste processes are allocated in the relevant module. In the case of the use of secondary materials or energy recovered from secondary fuels, the system boundary between the system under study and the previous system (providing the secondary materials) is set where outputs of the previous system, e.g. materials, products, building elements or energy, reach the end-of-waste state.

The end-of-waste state is determined by the economic cut-off method. This means that the environmental impacts of processes that cause costs for the initial product, like waste processing, are allocated to the initial product's life cycle. When processes raise the value of materials, which is for example the case in certain recycling processes, the environmental impact of the recycling process is allocated to the life cycle of the recovered materials. In this LCA, the data relating to the manufacturing of the wood wool insulation boards and the background processes for environmental impacts are relatively recent (2-5 years) and deviate less than 5% from reality. The processes used in the production of the wood wool insulation boards are relatively representative for the geographic region, meaning that the production location of the wood wool insulation boards lies within a similar region for which the relevant Ecoinvent environmental records have been selected. Allocation by mass, so eventual environmental profile 37.8% Simbach, 62.2% Zalaegerszeg. Total considered Heraklith products amount to 3.169% (Simbach) and 0.590% (Zalaegerszeg) of total mass of products produced in both plants. These percentages are used for allocation of the the total usage and emissions of both plants. The collected data is from the year 2018.

SCENARIOS AND ADDITIONAL TECHNICAL INFORMATION

- Raw material supply, transport and manufacturing (A1-A3) Treatment, transport and credits for incineration production waste included in A3;
- Transport to the customer and installation (A4-A5) During installation 2% product losses are considered;
- Transport after demolition, waste processing and disposal (C2-C4) An EOL scenario with 10% incineration, 90% landfill is considered;
- Reuse, recovery or recycling potential (from materials and/or useful energy carriers leaving the system boundaries) (D).

Reporting GWP separately (kg CO2-eq)	A1	A2	A3	A4	A5	C2	C3	C4	D
GWP - Total	1.68E+0	2.58E-1	1.71E+0	1.05E+0	1.11E-1	9.30E-2	1.17E+0	9.24E-2	-1.97E-1
GWP - Biogenic	-5.57E+0	0.00E+0	0.00E+0	0.00E+0	-1.11E-1	0.00E+0	5.57E-1	0.00E+0	0.00E+0
GWP - Fossil	7.25E+0	2.58E-1	1.71E+0	1.05E+0	2.23E-1	9.30E-2	6.17E-1	9.24E-2	-1.97E-1



DECLARATION OF SVHC

The product does not contain substances on the "Candidate List of Very High Concern for Authorisation" under the REACH regulation (if above 0,1% of the mass).



REFERENCES

- ISO 14040: Environmental management - Life cycle assessment – Principles and Framework', International Organization for Standardization, ISO14040:2006.
- ISO 14044: Environmental management - Life cycle assessment - Requirements and guidelines', International Organization for Standardization, ISO14044:2006.
- ISO 14025: Environmental labels and declarations -- Type III environmental declarations -- Principles and procedures', International Organization for Standardization, ISO14025:2006.
- NEN-EN 15804: Sustainability of construction works - Environmental product declarations - Core rules for the product category of construction products', NEN-EN 15804:2012+A1:2013.
- EcoChain, 2017, web: <http://app.ecochain.com>.
- NEN-EN 16783:2017: Thermal insulation products. Product category rules (PCR) for factory made and in-situ formed products for preparing environmental product declarations', NEN-EN 16783:2017.
- Bepalingsmethode - milieuprestatie gebouwen en GWW-werken', Version 3.0, Stichting Bouwkwiteit, January 2019.
- J. Malinauskaite; H. Jouhara; D. Czajczyska; P. Stanchev; E. Katsou; P. Rostkowski; R.J. Thorne; J. Colón; S. Ponsá; F. Al-Mansour; L. Anguilano; R. Krzyyska; I.C. López; A.Vlasopoulos; N. Spencer, Municipal solid waste management and waste-to-energy in the context of a circular economy and energy recycling in Europe, Energy, ISSN: 0360-5442, Vol: 141, Page: 2013-2044.



REMARKS

The Heraklith wood wool plants of Simbach and Zalaegerszeg are both ISO 9001, ISO 14001, ISO 50001 and ISO 45001 certified under the scope "Design, Development and Production of Insulation Materials and Systems".