

Environmental Product Declaration

according to ISO 14025 and EN 15804



This declaration is for:
Sneldek Aerlox

Provided by:
BMI Susteren



program operator
Stichting MRPI®
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COMPANY INFORMATION



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PRODUCT

Sneldek Aerlox

DECLARED UNIT/FUNCTIONAL UNIT

m²

DESCRIPTION OF PRODUCT

One square meter of concrete roofing applied to one pitched roof, which meets the minimum requirements of the Building Decree. Including the attachment of the roof covering to the roof. Exclusive insulation material and roof construction.

VISUAL PRODUCT



MRPI® REGISTRATION

1.1.00161.2020

DATE OF ISSUE

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SCOPE OF DECLARATION

This MRPI®-EPD certificate is verified by **Kamiel Jansen, Primum**.

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 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.

MORE INFORMATION

<https://www.monier.nl/producten/dakpannen/beton/aerlox>

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, Primum

[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.

Production

The concrete tiles are made out of cement, sand, pigments and coatings

Construction

In order to attach the tiles to the roof nails, hooks, battens and counterbattens are used. The reference service life (RSL) of the construction is 50 years.

COMPONENT (> 1%)	[kg / %]
Concrete tiles	confidential
Roof nails	confidential
Hooks	confidential
Battens and counterbattens	confidential

(*) > 1% of total mass

SCOPE AND TYPE

The concrete tiles are produced at the location of BMI Susteren and they are applied at the Dutch market. The prescribed waste scenarios from the "SBK Bepalingsmethode v3.0 incl. amendments July 2019, Jan 2020" have been used for the various materials in the product.

The background database is EcolInvent version 3.5. It is a specific EPD for a specific product and the type of this EPD is Cradle-to-Grave.

PRODUCT STAGE	CONSTRUCTION					USE STAGE							END OF LIFE				BENEFITS AND LOADS BEYOND THE SYSTEM BOUNDARIES
	PROCESS												STAGE				
	STAGE																
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	MNA	MNA	MNA	MNA	X	X	X	X	X	

X = Module assessed

MNA = Module not assessed

LCA Processflow tile production

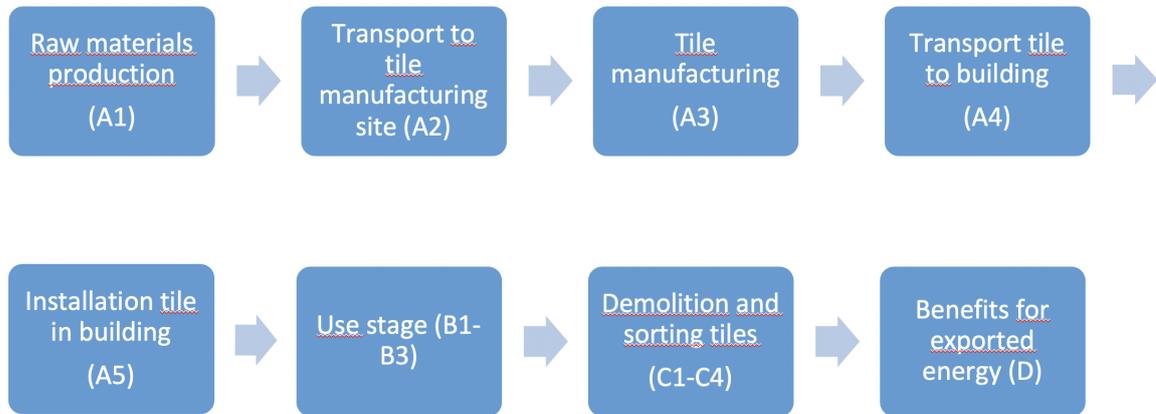


Figure: LCA process diagram according to EN 15804(7.2.1)



REPRESENTATIVENESS

The input data are representative for Sneldek Aerlox, a product of BMI. The data are representative for Netherlands.

ENVIRONMENTAL IMPACT per functional unit or declared unit

	UNIT	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	C1	C2	C3	C4	D
ADPE	kg Sb-eq.	9.21 E-6	7.87 E-7	5.36 E-6	1.54 E-5	1.82 E-6	1.02 E-5	0.00	0.00	0.00	0.00	6.12 E-7	3.57 E-8	2.08 E-9	-1.02 E-6
ADPF	MJ	5.28 E+1	4.30 E+0	2.28 E+1	7.99 E+1	9.96 E+0	2.09 E+1	0.00	0.00	0.00	0.00	3.35 E+0	8.33 E-1	5.61 E-2	-7.51 E+0
GWP	kg CO2-eq.	9.07 E+0	2.76 E-1	1.30 E+0	1.06 E+1	6.40 E-1	1.74 E+0	0.00	0.00	0.00	0.00	2.15 E-1	5.59 E-2	1.84 E-3	-5.39 E-1
ODP	kg CFC11-eq.	2.38 E-7	5.16 E-8	1.02 E-7	3.92 E-7	1.20 E-7	1.41 E-7	0.00	0.00	0.00	0.00	4.02 E-8	6.49 E-9	6.65 E-10	-6.01 E-8
POCP	kg ethene-eq.	1.77 E-3	1.64 E-4	4.40 E-4	2.38 E-3	3.80 E-4	1.16 E-3	0.00	0.00	0.00	0.00	1.28 E-4	3.20 E-5	2.01 E-6	-7.10 E-4
AP	kg SO2-eq.	1.60 E-2	1.20 E-3	2.96 E-3	2.02 E-2	2.77 E-3	7.19 E-3	0.00	0.00	0.00	0.00	9.32 E-4	2.79 E-4	1.39 E-5	-4.04 E-3
EP	kg (PO4)3--eq.	3.79 E-3	2.41 E-4	5.46 E-4	4.57 E-3	5.59 E-4	1.29 E-3	0.00	0.00	0.00	0.00	1.88 E-4	6.30 E-5	2.63 E-6	-1.06 E-3
Toxicity indicators (Dutch market)															
HTP	kg DCB-eq.	7.62 E-1	1.13 E-1	2.95 E-1	1.17 E+0	2.62 E-1	4.49 E+0	0.00	0.00	0.00	0.00	8.82 E-2	1.28 E-2	8.02 E-4	-3.56 E-1
FAETP	kg DCB-eq.	1.37 E-1	3.29 E-3	4.94 E-3	1.45 E-1	7.62 E-3	2.25 E-2	0.00	0.00	0.00	0.00	2.56 E-3	2.19 E-4	1.94 E-5	-6.33 E-3
MAETP	kg DCB-eq.	8.36 E+1	1.17 E+1	1.45 E+1	1.10 E+2	2.72 E+1	5.07 E+1	0.00	0.00	0.00	0.00	9.13 E+0	8.10 E-1	6.81 E-2	-1.08 E+1
TETP	kg DCB-eq.	3.56 E-2	3.91 E-4	3.86 E-3	3.99 E-2	9.05 E-4	8.72 E-3	0.00	0.00	0.00	0.00	3.04 E-4	1.62 E-4	2.00 E-6	-5.01 E-4
Environmental Cost Indicator (Dutch market)															
ECI	Euro	6.43 E-1	3.29 E-2	1.13 E-1	7.88 E-1	7.63 E-2	5.41 E-1	0.00	0.00	0.00	0.00	2.56 E-2	5.86 E-3	2.60 E-4	-8.80 E-2
ADPF in kg Sb-eq. (Dutch market)															
ADPF	kg Sb-eq.	2.54 E-2	2.07 E-3	1.10 E-2	3.84 E-2	4.79 E-3	1.01 E-2	0.00	0.00	0.00	0.00	1.61 E-3	4.01 E-4	2.70 E-5	-3.61 E-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
- 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	C1	C2	C3	C4	D
PERE	MJ	4.93 E-1	0.00	3.45 E-3	4.96 E-1	0.00	1.08 E-1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-1.03 E-2
PERM	MJ	3.15 E-1	0.00	2.20 E-3	3.17 E-1	0.00	6.34 E-3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PERT	MJ	2.30 E+0	4.52 E-2	1.03 E+0	3.37 E+0	1.05 E-1	8.64 E+1	0.00	0.00	0.00	0.00	3.52 E-2	4.50 E-2	4.64 E-4	-3.41 E+1
PENRE	MJ	1.15 E+1	0.00	8.03 E-2	1.16 E+1	0.00	2.47 E+0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-2.42 E-1
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
PENRT	MJ	5.11 E+1	4.59 E+0	2.29 E+1	7.86 E+1	1.06 E+1	2.05 E+1	0.00	0.00	0.00	0.00	3.57 E+0	8.40 E-1	6.02 E-2	-5.84 E+0
SM	kg	0.00	0.00	0.00	0.00	0.00	7.50 E-3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-8.18 E-4
RSF	MJ	3.49 E+0	0.00	2.44 E-2	3.51 E+0	0.00	7.02 E-2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NRSF	MJ	2.25 E+0	0.00	1.58 E-2	2.27 E+0	0.00	4.54 E-2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
FW	m3	6.08 E-2	7.32 E-4	8.11 E-3	6.96 E-2	1.70 E-3	9.58 E-3	0.00	0.00	0.00	0.00	5.70 E-4	3.48 E-4	5.86 E-5	-5.03 E-2

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

	UNIT	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	C1	C2	C3	C4	D
HWD	kg	2.87 E-4	2.74 E-6	3.63 E-5	3.26 E-4	6.36 E-6	5.44 E-5	0.00	0.00	0.00	0.00	2.14 E-6	1.28 E-6	3.79 E-8	-7.74 E-5
NHWD	kg	3.36 E-1	2.63 E-1	7.95 E-2	6.79 E-1	6.09 E-1	7.98 E-1	0.00	0.00	0.00	0.00	2.05 E-1	1.05 E-1	3.49 E-1	-5.32 E-2
RWD	kg	6.29 E-5	2.91 E-5	2.80 E-5	1.20 E-4	6.73 E-5	8.29 E-5	0.00	0.00	0.00	0.00	2.26 E-5	3.79 E-6	3.75 E-7	-1.73 E-5
CRU	kg	0.00	0.00	0.00	0.00	0.00	9.88 E-3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MFR	kg	0.00	0.00	2.42 E-1	2.42 E-1	0.00	7.37 E-1	0.00	0.00	0.00	0.00	0.00	3.46 E+1	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
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
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	1.63 E+1

HWD = Hazardous Waste Disposed
 NHWD = Non Hazardous Waste Disposed
 RWD = Radioactive Waste Disposed
 CRU = Components for reuse
 MFR = Materials for recycling
 MER = Materials for energy recovery
 EEE = Exported Electrical Energy
 ETE = Exported Thermal Energy

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.

Construction process stage (A4-A5)

This stage consists the transport of the product from production plant to the construction site. It also includes the loss of material during construction. The additional needed production, transport and end-of-life of the lost material during construction is included.

The end-of-life of packaging material up to the end-of-waste state or disposal of final residues is also included.

The installation of the product including manufacture, transportation and end-of-life of ancillary materials and any energy or water use required for installation or operation of the construction site are taken into account.

A4. transport to the building site	Unit/functional unit
Fuel type and consumption of vehicle	not available
-or- vehicle type used for transport	- lorry (Truck), unspecified (default)
Distance	150 km
Capacity utilisation (including empty returns)	50 % (loaded up and return empty)
Bulk density of transported products	inapplicable
Volume capacity utilisation factor	1

Use stage (B1-B3)

This stage consists of the impacts arising from components of the building and construction works during their use.

The stage also covers the combination of all planned technical and associated administrative maintenance actions during the service life to maintain the product installed in a building, in a construction works or its parts in a state in which it can perform its required functional and technical performance, as well as preserve the aesthetic qualities of the product. This will include preventative and regular maintenance activities.

B3. Repair	Unit/functional unit
Repair process	Repair of the parts;
Repair cycle	Amount for product reference service life of 50 years:
Waste materials resulting from repair	Amount for product reference service life of 50 years:

Product replacement (B4) and renovation (B5) only apply when the product is considered in a lifespan (of a building, work , etc.). Operational water and energy use are not considered.

End of life stage (C1-C4)

When the end of the life stage of the building is reached, the de-construction/demolition begins. This EPD includes de- construction/demolition (C1), the necessary transport (C2) from the demolition site to the sorting location and distance to final disposal. The end of life stage includes the final disposal to landfill (C4), incineration (C3) and needed recycling processes up to the end-of-waste point (C3). Loads and benefits of recycling, re-use and exported energy are part of module D.

The prescribed waste scenarios from the SBK Bepalingsmethode v3.0 incl. amendments July 2019, Jan 2020 have been used for the various materials in the product.

Supplementary information outside the building life cycle (D)

This stage contains the potential loads and benefits of recycling and re-use of raw materials/products. The loads contain the needed recycling processes from end-of-waste-point up to the point-of-equivalence of the substituted primary raw material and a load for secondary material that will be lost at the end-of-life stage. The loads and benefits of recycling and reuse are included in this module. The benefits are calculated based on the primary content and the primary equivalent.

In addition, the benefits of energy recovery are granted at this stage. The amount of avoided energy is based on the Lower Heating Values of the materials and the efficiencies of the incinerators as mentioned in the SBK Bepalingsmethode v3.0 incl. amendments July 2019, Jan 2020.

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

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

ISO 14044

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

ISO 14025

- 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

SBK-verification protocol

- SBK-verification protocol – inclusion data in the Dutch environmental database, Final Version 3.0, January 2019, SBK

SBK-Assessment Method

- Assessment Method Environmental Performance Construction and Civil Engineering Works (GWW), Version "3.0 January 2019" incl. amendments July 2019, Jan 2020, SBK

REMARKS

The aggregated MKI accross all modules is: €1,35/m²